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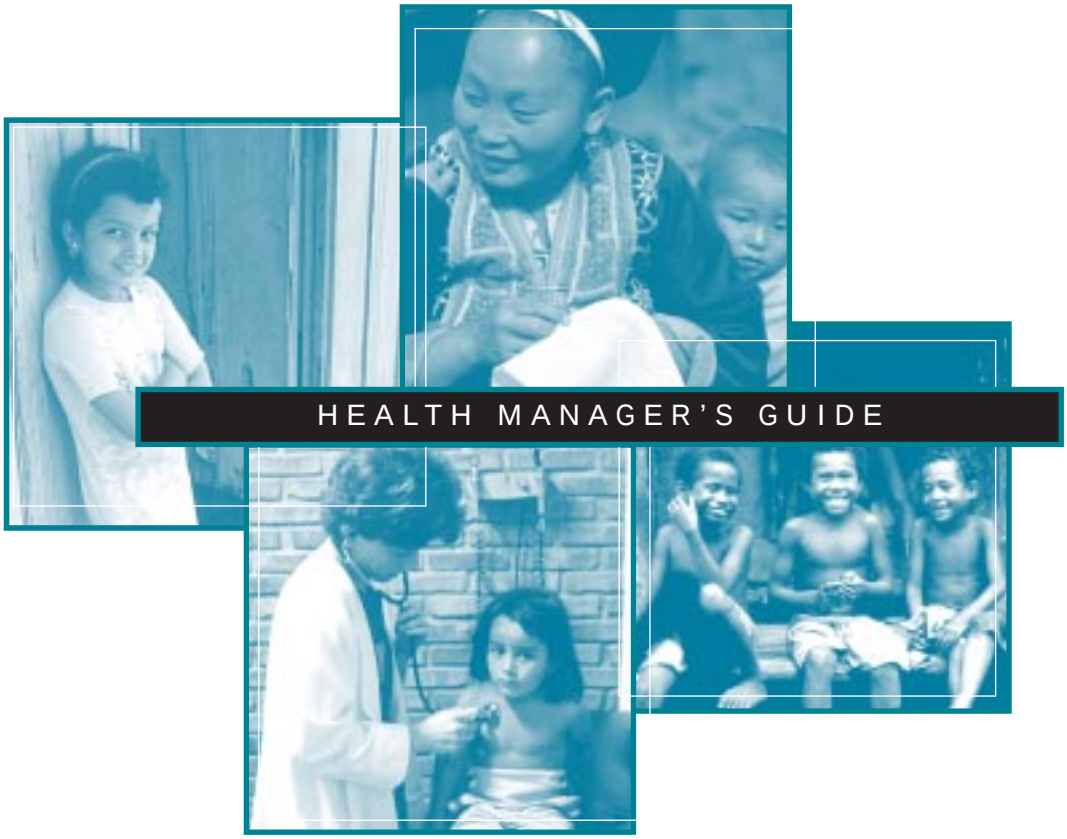


# Monitoring the Quality of Hospital Care

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## Contents



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# Monitoring the Quality of Hospital Care

*Joanne Ashton*

## *Abstract*

A revolution is taking place in the field of healthcare. The concept of "quality of care," a major concern in the '90s, is now reverberating into the new millennium, speeded by the advent of healthcare reform in many countries. Providing quality healthcare within the constraints of available resources is a challenging undertaking. Nonetheless, even in an environment with limited resources, methods are available to regularly monitor the quality of care by collecting and analyzing a core set of health indicators, and thereby laying the groundwork for improvement.

Peggy Koniz-Booher

This guide provides a systematic approach to implementing quality monitoring in a hospital. Quality monitoring is only one part of a comprehensive approach to improving the quality of healthcare. Some of the other components include: providing feedback to healthcare workers, training and supporting staff to undertake improvements leading to quality care, and designing solutions for closing identified quality gaps.

The focus of this guide is on measuring and analyzing processes rather than individuals. Seeking a culprit for poor outcomes is not the objective of monitoring. Too often individuals are held accountable for poorly designed systems and processes. In order to develop trust and involve staff in quality monitoring, the emphasis must be placed on the improvement of processes. The involvement of healthcare managers and providers in designing the monitoring process and assuming ownership are critical to establishing, implementing, and using an effective system that can lead to improved healthcare.

## *The Hospital as a System*

A system may be defined as an alignment of interdependent parts and processes that, in turn, deliver an outcome. Too frequently, however, the focus is on only a specific aspect of healthcare or service being provided, overlooking the interrelationship between the services and departments that make up a hospital system. Nothing functions in isolation, and a systems view provides a way to look at a system as a whole, thus allowing professionals to see how the care or service provided in one area relates to another.

A systems view includes consideration of the resources—called "inputs"— needed

to provide healthcare. Equally important are the activities, or processes, involved in providing care and services. These inputs and processes result in an outcome. Table 1 presents a systems view of some hospital services.

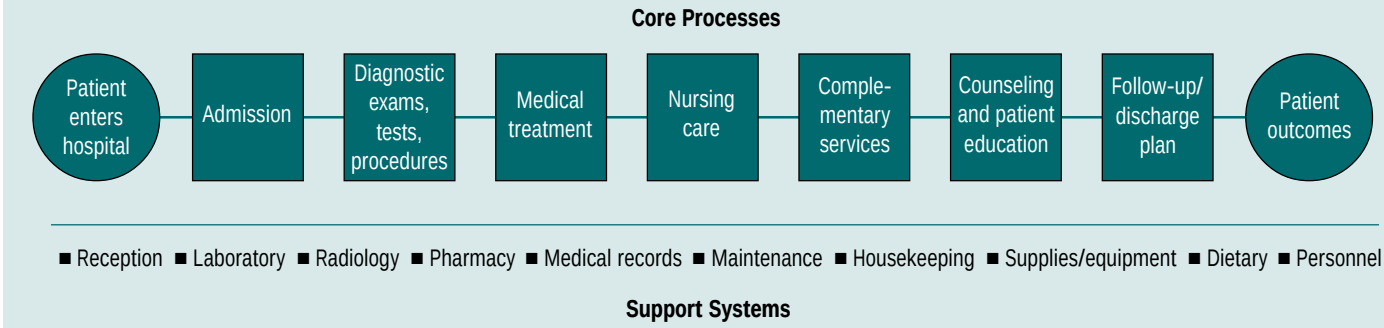
Hospitals are complex systems. Many services, such as rendering emergency care and providing meals, not only must be kept in operation over two or more shifts, but also must be implemented across departments. A systems view, for example, can reveal the process involved in transporting a patient treated in the emergency department to another part of the hospital for surgery. What is the process for letting the operating staff know the kind of care that was provided in the emergency department and the expected outcome of that care? When one part of the system fails, how does the failure affect the other parts? For example, if a gurney is not available, it will be difficult to quickly deliver the patient to the operating room. If there is not a process to inform other caregivers about the patient's medical history, the surgical staff may not receive the information they need to select the most appropriate kind of anesthesia and do so as quickly as possible.

**Table 1. Systems View of Hospital Services**

| Aspect of Care Management | Inputs | Processes | Outcomes |
|---|---|---|---|
| Management of diarrhea | ■ Hospital staff<br>■ Medications<br>■ Rehydration preparations<br>■ Laboratory tests<br>■ Protocol for management of diarrhea | ■ Use of the protocol<br>■ Medication administration<br>■ Rehydration administration<br>■ Testing procedures<br>■ Health education | ■ Diarrhea is resolved<br>■ Dehydration is resolved<br>■ Patient/family can describe preventative measures<br>■ Patient/family can describe when to seek further treatment |
| Medication availability | ■ Medications<br>■ Pharmacist<br>■ Nurse<br>■ Medication storage cart | ■ Stock management<br>■ Medication distribution | ■ Medications are available in the pharmacy<br>■ Medications are delivered to the unit/ department in a timely manner |
| Normal delivery/discharge planning | ■ New mothers<br>■ Physicians<br>■ Nurses<br>■ Family<br>■ Midwives<br>■ Teaching materials | ■ Communication between care providers<br>■ Education of patient and family | ■ Midwife has information regarding the mother's condition and follow-up care<br>■ The patient/family has home instructions |
| Infection control (postoperative cesarean section) | ■ All healthcare workers<br>■ Cleaning staff<br>■ Soap<br>■ Sterile equipment<br>■ Sterilizer<br>■ Materials for sterile dressing changes | ■ Hand washing<br>■ Sterilization of equipment<br>■ Wound care<br>■ Cleaning procedures | ■ Patients do not acquire infections while hospitalized |

Notes: a. Inputs are the resources needed to provide a service.
b. Processes are the activities that use these inputs.
c. Outcomes are the results of the processes.

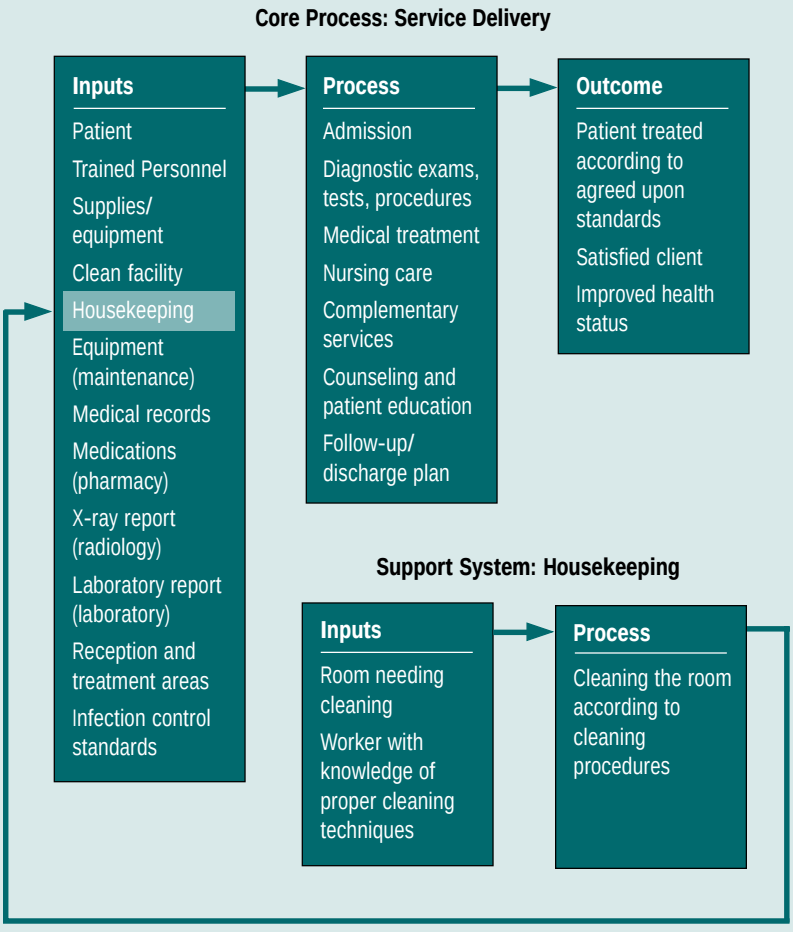
**Figure 1: Hospital Processes**




## *Quality Monitoring Framework*

The framework presented in Figure 1 is based on the systems model. As the diagram shows, a patient who enters the hospital becomes involved in a variety of processes that will lead to an outcome. Most patients will experience all or most of these processes during an inpatient stay. Some of the processes can be defined as "supportive" inasmuch as they are not direct care. For example, the admission process and medical record systems are needed to support patient care and treatment. During the admission process, the patient or family provides biographical information, and the staff creates a medical record (the information system). The physician, laboratory, and radiology staff carry out various diagnostic exams, tests, and procedures. Nursing care is an integral process to the hospital system as are other complementary services such as nutrition, social services, and physical therapy. Counseling and patient education take place all along the continuum of care as physicians, nurses, and others explain what can be expected during the tests, procedures, and treatment processes as well as the diagnosis and follow-up/ discharge plan. (Figure 2 demonstrates the systems view and shows how the various hospital processes interrelate.)

**Figure 2: System Model**



# *Introduction to Quality Monitoring*

Most hospitals have a health information system to collect data. The data often include the number and types of diseases treated, surgeries performed, and patients seen per day. Typically, the data are tabulated in the Medical Records Department, which submits a report to the hospital director. However, the information may not be sufficient or may be presented in a way that would not help healthcare providers draw conclusions on the quality of care and make sound decisions to improve it. A monitoring system should enable healthcare providers to set priorities, establish quality indicators, and assess the hospital's systems performance to ensure that desired outcomes are achieved.

The foundation of a monitoring system is standards. Standards are the guidepost for achieving quality. The data collected through monitoring provide a way to compare performance with standards, both at a specific point in time and over a period of time, and also with the performance of other hospitals. The results provide a way to determine causes for variance and identify areas for improvement.

## Criteria

An effective monitoring system meets the following criteria:

- Data are collected regularly and over a significant period of time so that the hospital can monitor the trends in the indicators
- Data collection is a routine activity integrated into daily tasks
- Data are used to identify the presence and causes of system problems that can result in poor performance
- Data are used to guide management decisions

## Standards

A standard is an expectation of quality that is explicit (written) or implicit (understood). "Implicit" healthcare standards derive from the expertise of professionals who work in a specific environment. For example, professionals who work on the pediatric ward may know the treatment that a dehydrated child needs, but differ on ideas about the most appropriate way to provide the treatment (e.g., dosage, duration, and frequency). Converting implicit standards to explicit standards provides uniformity in the way to provide quality care and allows a baseline measure for monitoring quality.

"Explicit" healthcare standards appear in a variety of forms, such as specifications, procedures, or protocols (as noted in Table 2). These standards may be developed by a Ministry of Health, professional organizations (e.g., International Council of Nurses, medical associations), international organizations (e.g., the World Health Organization: standards for the treatment of malaria), accrediting organizations (e.g., Joint Commission Resources, Zambia Health Accreditation Council), or by a hospital itself.

Applied standards should be based on the most up-to-date research and should be:

- Realistic: The standard can be followed or achieved with existing resources
- Reliable: Following the standards for a specific intervention results in the same outcome (all factors being equal)
- Valid: The standard is based on scientific evidence or other acceptable experience
- Clear: The standard is understood in the same way by everyone concerned and is not subject to distortion or misinterpretation
- Measurable: The standard is amenable to assessment and quantification

Table 2 presents a taxonomy of health system standards. It categorizes different formats for standards into system components (inputs, processes, and outcomes) and domains (both administrative and technical). Table 3 describes the technical process standards and their use.

## Multidisciplinary Quality Teams

Healthcare workers function as a team to provide an environment for healing. All team members (e.g., physicians, nurses, therapists, lab personnel, and cleaning personnel) bring different knowledge, skills, and experience to this task. Thus, all the hospital disciplines must be involved in the quality monitoring activities.

Standards developed by cross-departmental multidisciplinary teams ensure that the standards of care for each health condition are the same throughout the hospital. For example, the standards for initiating intravenous therapy should be the same in the emergency department as on the wards. Thus, when developing the standards for administering intravenous therapy, the team should include representatives from the emergency department, the wards, the operating room, and other areas where this service is performed. The same is true for infection control standards; the procedure for routine hand washing should be the same throughout the hospital.

## Selecting the Outcome or Process for Monitoring

The choice of outcomes or processes to be measured is an important consideration for the hospital, as it will be impossible to measure all events. An outcome is the result of care. Outcomes may be negative (infection, injury, etc.) or positive (patient satisfaction). A process is the series of steps taken to achieve an outcome (e.g., compliance with protocols or procedures for a specific diagnosis/condition). Outcomes and processes included in the monitoring plan should be those that have the most important impact on the population served. Outcomes or processes for monitoring can be selected based on frequency of the event, impact of negative outcomes (such as treatment costs, length of stay, mortality, and morbidity), client needs, health needs of the community, hospital mission, and strategic goals (Lee et al. 1998).

### Table 2. Taxonomy of Health System Standards

| | Domains | |
|---|---|---|
| **System Components** | **Administrative** | **Technical** |
| Input | Administrative policies<br>Rules and regulations<br>Qualifications* | Job descriptions*<br>Specifications* |
| Process | Standard operating procedures | Algorithms<br>Clinical pathways<br>Clinical practice guidelines<br>Procedures<br>Protocols<br>Standing orders |
| Outcome | Expected results* | Patient health outcomes |

*Standards that may be applied to either domain are identified with an asterisk.

Because a consistent terminology will improve communication among healthcare managers, the Quality Assurance Project provides a definition of these terms in the glossary on page 48. Examples of these formats and further explanation of key standard formats can be found in the guide and appendix.

### Table 3. Technical Process Standards: Description and Use

| Standard Format | Description | Use |
|---|---|---|
| Clinical practice guidelines | Recommendations for medical care based on current research | Physician's reference in management of specific situations or conditions |
| Clinical pathways | Expected, multi-disciplinary daily plan of treatment used in hospitals | Nurses, physicians, and others use daily plan to progress patient to health |
| Algorithms | Flowcharts or decision grid | Quick, visual, help make decisions |
| Procedures | How-to, step-by-step instructions | Directions on how to perform a technical skill, e.g., insert a urinary catheter |
| Protocols | Management of patient care | Patient care management for specific situations, care of the patient with a urinary catheter or specific conditions, e.g., postoperative patients |
| Standing orders | A pre-established set of medical orders | Permit nurses and/or other professionals to initiate medical orders in the absence of a physician, e.g., a patient with a cardiac arrhythmia in a critical care unit |

Further explanation of the use of these and other standards is provided in Appendix 1.

Peggy Koniz-Booher

## Indicators

An indicator of quality is a measure that is used to determine the degree of adherence to a standard. Indicators translate a qualitative statement (as expressed by a standard) into a quantitative one. For example, "the proportion of healthcare providers who greet their patients by name" measures the extent to which the standard for a quality reception is being met. Indicators can be expressed as a number (a count), an average, or a ratio (a proportion or rate). An indicator presented as a ratio consists of a numerator (the number of times an event occurs) and a denominator (the total number of times the event should have occurred). An example of a ratio is the proportion of post-surgical patients whose temperature was taken by the healthcare worker according to protocol.

It is useful to select indicators that measure inputs, processes, and outcomes. The basis for selecting an indicator is its importance or potential impact on the quality of care. Be aware that outcome indicators measure the level of achievement of the intervention and, therefore, can serve as indirect measures of the quality of care and services. However, a good outcome does not necessarily mean that the process was managed correctly; neither does a poor outcome mean that the process was managed incorrectly. Therefore, the measurement of input, process, and outcome indicators is warranted.

Some quality experts believe that organizations should strive for zero defects. They suggest that setting a level of expected quality limits the highest level of quality that might otherwise be achieved. The belief is that once the quality level—e.g., targeted infection control rates—is attained, the staff will be satisfied with this level rather than continuing to strive to decrease infection control rates to zero infections. Keeping this view in mind, establishing indicators remains an established means of setting the bar at a reasonable level of achievement and the bar can (and should be) raised/lowered as the targets are achieved.

## External and Internal Monitoring

"External monitoring" is monitoring conducted by someone from outside the hospital. The monitor may be a representative of the Ministry of Health, a neighborhood health committee, or an agency contracted to measure compliance with specific standards; these standards are often established by the external entity doing the measuring. Accreditation of the hospital, as conducted by Joint Commission International and Council for Health Service Accreditation of Southern Africa (COHSASA), is an example of an external monitoring system. A discussion of external monitoring is not within the scope of this guide.

"Internal monitoring" is a system set up by the hospital staff who adopt standards written by another credible group (e.g., the World Health Organization) or by the hospital itself; the hospital can conduct a self-assessment to measure the degree of compliance. An approach to developing an internal monitoring system follows.

## Ongoing Monitoring versus Spot Checks

Ongoing monitoring involves regularly measuring quality indicators. Some indicators may be important enough (e.g., maternal mortality or infection rates) to measure frequently and regularly (e.g., monthly): This concept is often referred to as "trending." However, because it is not feasible to measure the hundreds of standards that are in existence, spot checks may be conducted to measure specific standards during a specific period of time. A spot check may be done on a one-time basis, or, as an example, the quality team may decide to monitor the effectiveness of a new patient education program for six months.

## An Incremental Approach

To avoid becoming overwhelmed with quality monitoring, it is important to initially limit the scope by selecting a few key indicators that are of the highest priority. High-volume, high-risk, and problem-prone processes are frequently given highest priority. High volume refers to the number of cases seen, e.g., number of maternity patients admitted each year. High-risk processes have a potential of resulting in harm to the patient or staff. Problem-prone processes are those that have been recognized by the authorities or staff as having poor outcomes. Many hospitals monitor medication errors because medication administration has been identified as a problem-prone process and also could be considered a high-risk process. Once a quality monitoring system is in place, the process can be expanded to include additional indicators.

## Two Approaches for Monitoring Quality

In this guide, two approaches are proposed:

1. The Quick Start—monitoring a minimum number of key indicators
2. Implementing a Monitoring System—planning and organizing a monitoring system and monitoring key processes

If there is no monitoring system in place, the Quick Start is the place to begin. However, if there are standards already established and the monitoring of a few key indicators is working, the team may proceed to implementing a monitoring system. Organizations that have a functioning monitoring system could skip the section on organizing a monitoring system, and use the approach of monitoring key processes.

# *The Quick Start*

The Quick Start encompasses the standards, indicators, minimum mandatory measures, and data collection methods to be employed. As soon as a quality coordinator is selected and a quality team is established, the team can begin the monitoring process. Monitoring one or two of the indicators is a good way to begin.

Two indicators of quality of care were selected to exemplify the tools and methods in this Health Manager's Guide: surgical infection and mortality rates. These indicators not only relate to every hospitalized patient, but also yield grave outcomes if standards are not met.

## Step 1: Identify a Quality Coordinator

Hospital management will want to select someone to coordinate the monitoring effort. This individual should have an interest in quality monitoring, have the respect of staff, have an ability to facilitate teamwork, and be allotted time to devote to this activity.

## Step 2: Form a Quality Team

A team of six to eight staff members should be organized to implement the monitoring. Because the two indicators that will be monitored in this Guide are surgical infection rates and mortality rates, the team should include staff who are involved in processes that could result in infection or mortality, e.g., staff from surgery, obstetrical services, hospital wards, and other departments, such as equipment/

supply management. Team members are selected based on their knowledge and experience in the area and their willingness to participate. The coordinator will orient the team to the rationale for quality monitoring and the process.

Note: In this document, we use example 1 (monitoring infections) to show how steps 3–6 are implemented and then move on to example 2 (monitoring mortality) to show again how those same steps are done.

**Table 4. Indicator for Surgical Infection Rates**

| Indicator | Formula | Data Source for Numerator | Data Source for Denominator | Person Responsible for Collecting Data |
|---|---|---|---|---|
| Surgical infection rates | Number of patients developing infections in clean surgical wounds while hospitalized in the prior calendar month / Total number of patients who underwent clean surgeries in the operating room in the prior calendar month | Data collection tool or medical records | Surgical register (or a log may need to be developed to record surgeries) | Nursing supervisor (or a person assigned by a supervisor) |

**Table 5. Monitoring Surgical Infection Rates**

Instructions:

- Identify the ward and the date of data collection
- List each surgical patient by medical record number
- Identify the type of surgery
- Based on the infection criteria, observe the surgical incision and determine whether an infection exists. Indicate Y (yes) or N (no) in the column
- Indicate the physician who performed the surgery (some hospitals identify physicians by a numerical code)

| Ward: Surgical 2 South | | Date: August 5, 2000 | |
|---|---|---|---|
| Surgical Patient | Type of Surgery | Infection (Y or N) | Physician |
| # 4589 | Cholecystecotomy | N | Gomez |
| # 8756 | Appendectomy | Y | Lorenzo |

## *Example 1*
## Step 3: Measure Infection Control Rates

### *Nosocomial (hospital-acquired) infections*

Hospital infection is one of the most common adverse outcomes of hospitalization, occurring among 6 to 17 percent of patients (Huskins et al. 1998). Although the hospital can and should monitor overall infection rates, it may initially be easier to work with a less inclusive population. Surgical infection rates can provide a starting point. Table 4 is an example of the information needed to develop an indicator for monitoring surgical infection rates.

### *Monitoring strategies*

The most effective means of determining infection rates is direct patient observation by nurses or physicians. When direct observation is not feasible, the monitoring team can examine operative records to identify patients who have had surgical procedures, noting which patients have developed wound infections while in the hospital.

### *Data collection*

Develop the data collection tool and train personnel in data collection methods. Table 5 is a sample tool for monitoring surgical infection rates. Data must be collected for a minimum of one calendar month (U.S. Department of Health and Human Services 1998). It is best to use the same persons to collect data and conduct the observations, preferably at the same time each day. The criteria for determining the presence of an infection are included in Table 6. The data derived provide the information necessary to arrive at the infection rates. Table 7 demonstrates how to calculate the infection rate.

### *Threshold*

The outcome standard for surgical infections should be 0 percent, that is, none of the patients undergoing major surgery develops a surgical wound

infection. However, infections do occur, so a threshold is typically established to determine when the team believes it is important to investigate problems. For example, a threshold set at 3 percent would indicate that if the infection rate were greater than 3 percent, the team would take action.

### *Standards*

If the infection rate is higher than the established threshold, the process standards for infection control can be measured to determine whether the hospital's processes are contributing to any increase or decrease in surgical infection rates. Process standards include hand washing duration and frequency, surgical preparation of the wound, equipment sterilization, protocols for managing the postoperative patient's care, and protocols for patient and family education. Standards related to inputs needed for infection control also can be measured. Inputs for infection control include soap, sterile towels and equipment, and gloves.

## *Example 1*
## Step 4: Compile the Data

Once the data is collected, it must be compiled. This includes aggregating information, calculating the percentages, and graphically displaying the information in charts, bar graphs, etc. Information can be more easily interpreted when the information is properly displayed. Figure 3 is an example of a graph depicting the overall hospital infection rates. Table 7 shows how to calculate surgical site infection rates.

In the case of infection rates, the data can be compiled to view the information in terms of the prevalence of infections on different wards, according to type of surgery, and by physician. Some hospitals include data on other factors that increase the risk of developing an infection, such as length of preoperative stay and length of surgery (from start of incision to closure).

### Table 6: Infection Criteria

Infection criteria: To distinguish between clean wounds and infections, the monitoring team looks for any one of the following signs of infection (U.S. Department of Health and Human Services 1998).

Meets ONE of the following criteria:

- Purulent drainage from incision
- Pain or tenderness
- Localized swelling, redness or heat, fever (greater than 38 degrees C)
- Organisms isolated from clean incision culture
- Physician diagnosis of nosocomial surgical site infection (any mention of wound infection)

Inclusion criteria: A patient must have undergone an operation, which is defined as a single trip to the operating room in which a surgeon makes at least one incision through the skin and closes the incision before the patient leaves the operating room.

Exclusion criteria: treatments and procedures that do not apply are excluded from measurement. These include:

- Dental procedures
- Debridement and operative wound cleaning
- Abscess drainage of contaminated wounds
- Known incisional wound infections
- Stitch abscess (minimal inflammation and discharge confined to the points of suture penetration)
- Infection of an episiotomy

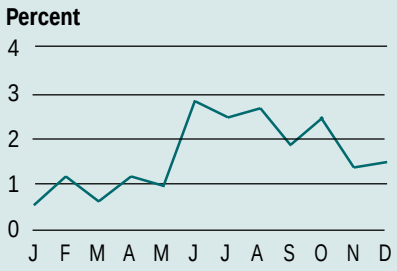
### Table 7. Surgical Site Infection Rates

| Number of surgical wounds in the last calendar month | Number of Infections | Overall Infection Rate (%) (Number of infections divided by the number of surgical wounds x 100) |
|---|---|---|
| 100 | 5 | 5% |

It is possible to establish an infection rate for specific surgeries. An example calculation of a cesarean section rate is given below.

| Number of cesarean sections in the last calendar month | Number of infections in cesarean sections | Infection rate for cesarean sections (number of infections divided by the number of c-sections x 100) |
|---|---|---|
| 20 | 5 | 25% |

**Figure 3. Overall Hospital Infection Rates**




### *Example 1*
### Step 5: Analyze the Data

What does the information tell us? The team will want to monitor the trends by comparing the overall rates from one month to another.

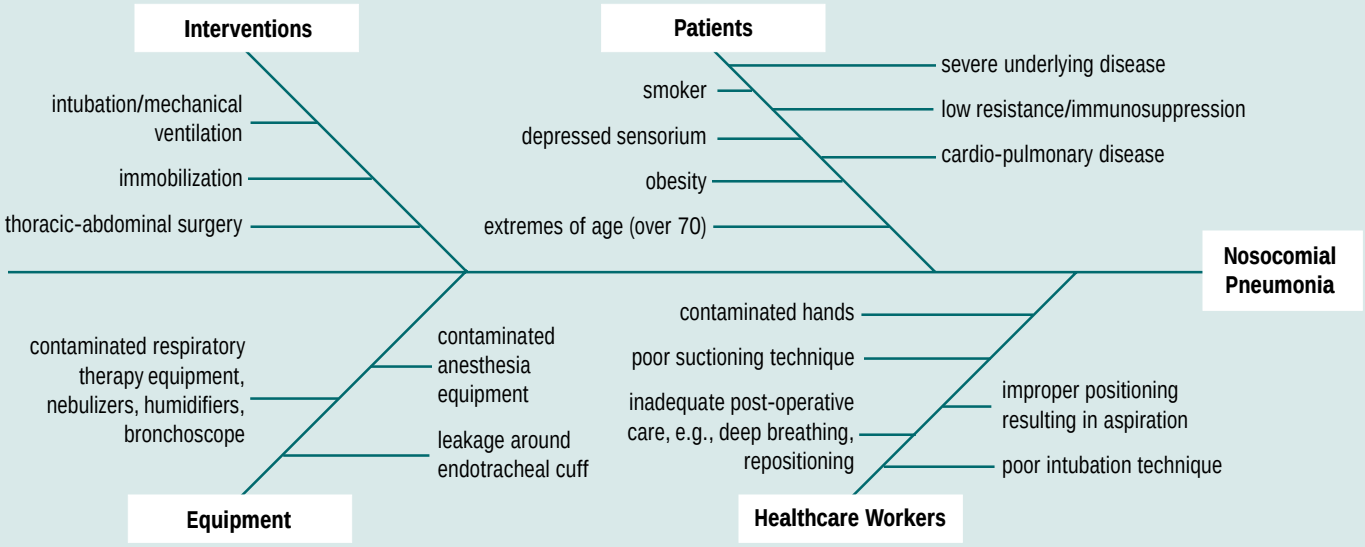
One way to analyze the data is to use a flowchart. A flowchart allows the team to consider all aspects of care and identify deficiencies, such as a lack of standards in the healthcare process. When analyzing monitoring information, a review of recent literature will prove helpful. In the case of surgical site infections, a number of factors have been identified that increase the risk for infection. Long preoperative stays, shaving of the skin the evening before surgery, perioperative antibiotic prophylaxis, agents used for the surgical scrub before surgery, surgical linens, supplies used for surgical site care, dressing carts that are wheeled from bed to bed, and the type and storage of disinfectants are all factors that can affect infection rates (Huskins et al. 1999; Classen et al. 1992). The flowchart in Figure 4 is a tool for helping the monitoring team determine the probable source of an increased infection rate.

**Figure 4. Flowchart: Infection Control**

*Patient Flow* →

| | Preoperative Stay | Surgical Preparation | Operating Room | Ward | Discharge | Outcome |
|---|---|---|---|---|---|---|
| **Inputs** | Number of preoperative hospital days | Written procedures for surgical skin preparation<br>Supplies and materials available for surgical preparation | Written procedures for surgical scrub and reprocessing procedures: cleaning methods, sterilization, disinfecting, packaging, storage<br>Sterile equipment and supplies available<br>Length of surgery | Written procedures for hand washing and surgical wound care<br>Sufficient facilities and supplies for hand washing (e.g., sinks, soap, water supply, towels)<br>Separate clean and dirty utility areas | Patient home care instruction sheets | Surgical incision heals without incident |
| **Processes** | Determine antimicrobial resistance | Surgical skin preparation practices<br>Appropriate perioperative antibiotic prophylaxis<br>See Appendix 5 | Number of air exchanges<br>Proper reprocessing procedures<br>Surgical scrub compliance<br>Proper cleaning of respiratory equipment<br>Proper maintenance of surgical barrier<br>Use of proper sterile procedures | Surgical site care according to procedure<br>Hand washing compliance<br>Proper isolation practices<br>Dressing cart/trolley use<br>Appropriate collection of clinical specimens | Patient and family education regarding wound care and signs of infection | |

## Figure 5. Fishbone Diagram: Nosocomial Pneumonia




Another way to discuss potential causes for high infection rates is to use a cause-and-effect diagram. The team can use a fishbone diagram to organize their ideas. The team will start by identifying the main categories of causes. Common categories include equipment, supplies, client/patients, healthcare workers, procedures, and treatments. The team then considers all the potential causes for the effect in question. Figure 5 shows a fishbone diagram of potential causes of nosocomial pneumonia (the effect). Note in the example that the team used the categories of interventions, patients, equipment, and healthcare workers to discuss the potential causes of nosocomial pneumonia in their hospital.

### *Example 1*
### Step 6: Report the Data

The team will prepare and distribute the reports to appropriate groups. In addition to sharing the statistics, the reports should include the team's analysis of the data, conclusions, and recommendations for improving the quality of care. Figure 6 is an example of a surgical wound infection summary. Figure 7 is a graphic display of the information.

## Figure 6. Surgical Wound Infection Summary

**1st Quarter**

72 surgical procedures were performed

Inpatient and 30-day postoperative surveillance were completed

No infections were identified for a rate of **0%**

**2nd Quarter**

110 surgical procedures were performed

Inpatient and 30-day postoperative surveillance were completed

1 soft tissue infection was identified for a rate of **0.91%**

Year-to-date infection rate of **0.55%**

**3rd Quarter**

82 total surgical procedures were performed

Inpatient and 30-day postoperative surveillance were completed

1 soft tissue infection was identified for a rate of **1.22%**

Year-to-date infection rate of **0.76%**

**4th Quarter**

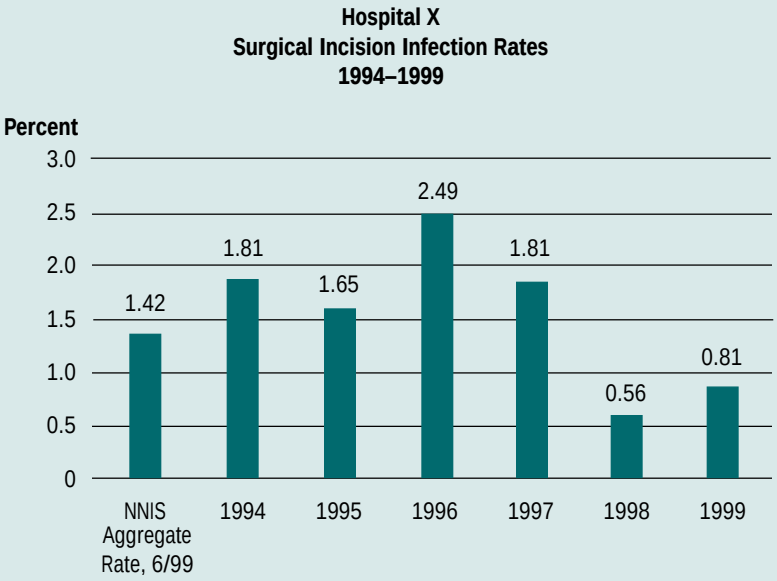
106 surgical procedures were performed

Inpatient and 30-day postoperative surveillance were completed

1 soft tissue infection was identified for a rate of **0.94 %**

Year-to-date infection rate of **0.81%**

## Figure 7. Surgical Incision Infection Rates Graph




The first rate listed refers to the national rate, which should be included when available.

## Table 8. Indicator for Inpatient Mortality Rates

| Indicator | Formula | Data Source for Numerator | Data Source for Denominator | Person Responsible for Collecting Data |
|---|---|---|---|---|
| Overall inpatient mortality rate | Total number of inpatient deaths where patient is identified as "deceased" in prior calendar month / Total number of inpatient admissions during the prior calendar month | Death register (or a log can be developed) | Discharge register | Medical record staff |

## Table 9. Monitoring Tool for Inpatient Mortality Rates

| Ward | Total Admissions in Prior Calendar Month | Total Deaths in Prior Calendar Month | Number of Unexpected Deaths |
|---|---|---|---|
| 4 South | 300 | 1 | 0 |
| Maternity | 100 | 1 | 1 |
| Pediatrics | 100 | 1 | 1 |
| Totals: | 500 | 3 | 2 |
| Mortality rate | # deaths divided by # admissions x 100 | 3 divided by 500 x 100 = 0.6% | 2 divided by 500 x 100 = 0.4% |

### *Example 2*
### Step 3: Measure Mortality Rates

Although overall hospital death rates do not reveal the severity of illness or the risk factors involved in treating an illness, they do provide the means for monitoring progress over time. Often mortality rates are viewed as the key indicator for quality of care provided by a hospital. Here again, the ideal outcome is that no hospitalized patients die from inadequate or negligent care.

#### *Monitoring strategies*

Trending of mortality rates is the most common monitoring practice. Typically, there are figures at a national, regional, and local level. Infant and maternal mortality rates are of particular concern as an indicator of a country's overall healthcare. Information regarding deaths is gleaned from patient records and reported to the state. The information is stratified according to ages, gender, and causes. Deaths also may be classified as a *sentinel event.* A sentinel event, as defined by the Joint Commission on Accreditation of Healthcare Organizations, is an unexpected occurrence involving death or serious physical or psychological injury. These events are called "sentinel" because they signal the need for immediate investigation and response. Perinatal and maternal deaths, infection-related deaths, returns to the operating room, and cardiac or respiratory arrests are examples of sentinel events. Table 8 is a sample indicator for inpatient mortality rates.

#### *Data collection*

Table 9 displays the way to list the data on ward-by-ward deaths and compare these data with the number of total admissions. Some hospitals prefer to list the total number of deaths and use a separate column to list the number of unexpected deaths. The rationale is that some patients are admitted to the hospital and are expected to die (e.g., patients dying from AIDS or cancer). In this way, the team can differentiate between expected deaths and those deaths that may be a result of negligent or inadequate care.

### *Threshold*

A threshold also could be set for mortality rates. For instance, a threshold of 1 percent would instigate a further investigation of the cases that resulted in mortality. The hospital may choose to define deaths that would be considered sentinel and institute a policy regarding the process for conducting a thorough investigation.

### *Standards*

Unlike standards for infection control, there are no specific standards written to prevent mortality. However, the standards used to monitor the quality of care will be directly related to the type of death that occurred. For instance, if a woman dies during childbirth, the standards of care for obstetrical care would be used to determine whether the care and treatment of the mother was appropriate. If a patient on a ventilator dies as a result of nosocomial pneumonia, the team will use the standards related to ventilator management to assess the quality of care.

## *Example 2*
## Step 4: Compile the Data

Data related to mortality also may be compiled in terms of where the deaths occurred, type of surgery or diagnosis, pre-hospital condition, physician, or other factors felt to contribute to the death rate. Figures 8, 9, and 10 show different ways to present mortality data.

When data are available from other hospitals, the team may want to compare its rates against those of other hospitals. However, caution must be taken in this comparison in terms of whether similar data collection methods were used and whether risk adjustment has been applied to the data. Risk adjustment refers to figuring the number of high-risk patients into the rates, e.g., some regional hospitals receive the more high-risk patients. It would be inaccurate to compare this hospital's mortality rates with another hospital that refers the high-risk patients to other facilities. Thus, some organizations publish mortality rates that are risk-adjusted.

**Figure 8. Mortality Rates per Month**

**Death/Admission (per Month)**

| Month | Frequency | Percent |
|---|---|---|
| January | 65 / 1899 | 3.42 |
| February | 61 / 1906 | 3.20 |
| March | 74 / 2147 | 3.45 |
| April | 68 / 2054 | 3.31 |
| May | 67 / 1067 | 3.24 |
| June | 64 / 2224 | 2.88 |
| July | 64 / 2338 | 2.75 |
| August | 60 / 2357 | 2.54 |
| September | 52 / 2225 | 2.34 |
| October | 64 / 2220 | 2.88 |
| November | 63 / 2054 | 3.06 |
| December | 54 / 2272 | 2.38 |
| Total | 756 / 25763 | 2.93 |

**Figure 9. Mortality Rates by Gender and Age**

| | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| Age group | Number | Percent | Number | Percent | Number | Percent |
| Still birth | — | — | 2 | 0.26 | 2 | 0.26 |
| Neonatal | 21 | 2.78 | 13 | 1.72 | 34 | 4.50 |
| Pediatrics | 42 | 5.56 | 24 | 3.17 | 66 | 8.73 |
| Adults | 279 | 36.90 | 124 | 16.40 | 403 | 53.30 |
| Elderly | 170 | 22.49 | 81 | 10.72 | 251 | 33.21 |
| Total | 512 | 67.72 | 244 | 32.28 | 756 | 100.00 |

## *Example 2*
## Step 5: Analyze the Data

Mortality, of course, is not a process; it is an outcome. The key questions when investigating a death are "What happened?" and "Why did it happen?" One means of evaluating the potential causes of mortality is to review the key hospital processes in terms of the dimensions of quality (Table 10) as shown in the flowchart in Figure 11.

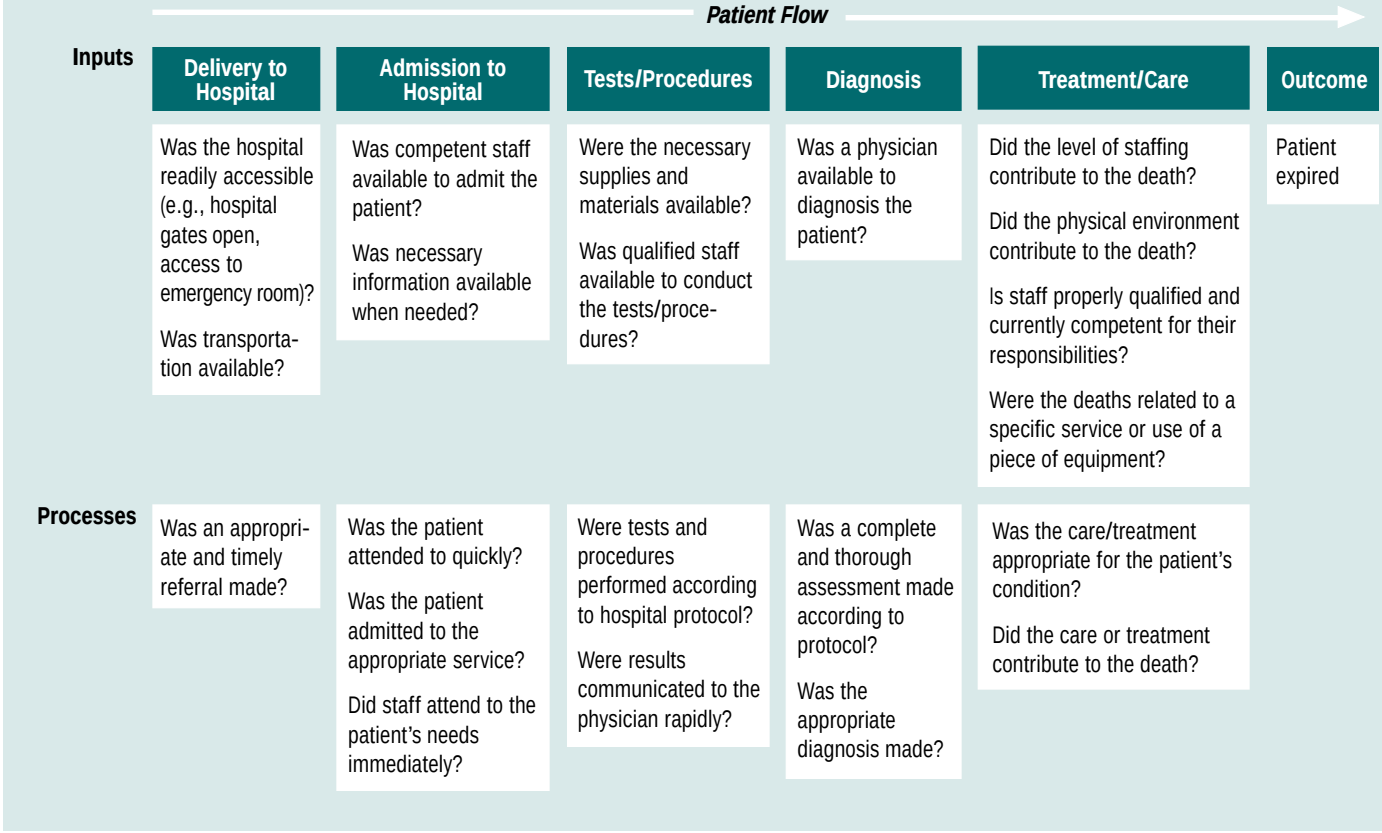
## Figure 10: Mortality Rates by Body System and Age

| System | Neonatal | | Pediatrics | | Adults | | Elderly | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| Cardiovascular system | 11 | 1.45 | 34 | 4.50 | 154 | 20.37 | 117 | 15.48 | 316 | 41.80 |
| Central nervous system | 5 | 0.66 | 18 | 2.38 | 97 | 12.83 | 49 | 6.48 | 169 | 22.35 |
| Renal system | 11 | 1.45 | 8 | 1.06 | 73 | 9.66 | 52 | 6.88 | 144 | 19.04 |
| Urinary-genital system | 3 | 0.40 | 10 | 1.32 | 84 | 11.11 | 53 | 7.01 | 150 | 19.84 |
| Gastrointestinal system | 2 | 0.26 | 9 | 1.19 | 77 | 10.18 | 38 | 5.03 | 126 | 16.66 |
| Cancer | 1 | 0.13 | 5 | 0.66 | 68 | 8.99 | 53 | 7.01 | 127 | 16.79 |
| Blood | 2 | 0.26 | 2 | 0.26 | 36 | 4.76 | 14 | 1.85 | 54 | 7.13 |
| Orthopedics | — | — | 2 | 0.26 | 8 | 1.06 | 12 | 1.59 | 22 | 2.91 |
| Miscellaneous | 3 | 0.40 | 6 | 0.79 | 20 | 2.65 | 9 | 1.19 | 38 | 5.03 |
| General | 8 | 1.06 | 10 | 1.32 | 108 | 14.29 | 63 | 8.33 | 189 | 25.00 |
| Pre-maturity | 11 | 1.45 | — | — | — | — | — | — | 11 | 1.45 |
| Diabetes | — | — | 1 | 0.13 | 36 | 4.16 | 55 | 7.28 | 92 | 12.17 |
| Opthamology | — | — | — | — | 1 | 0.13 | — | — | 1 | 0.13 |
| Still birth | 2 | 0.26 | — | — | — | — | — | — | 2 | 0.26 |

## Table 10. Dimensions of Quality of Care

| Dimension | Explanation |
|---|---|
| Technical performance | The degree to which the tasks carried out by health workers and facilities meet expectations of technical quality (i.e., comply with standards) |
| Effectiveness of care | The degree to which desired results (outcomes) of care are achieved |
| Efficiency of service | The ratio of the outputs of services to the associated costs of producing those delivery services |
| Safety | The degree to which the risks of injury, infection, or other harmful side effects are minimized |
| Access to services | The degree to which healthcare services are unrestricted by geographic, economic, social, organizational, or linguistic barriers |
| Interpersonal relations | Trust, respect, confidentiality, courtesy, responsiveness, empathy, effective listening, and communication between providers and clients |
| Continuity of services | Delivery of care by the same healthcare provider throughout the course of care (when appropriate) and appropriate and timely referral and communication between providers |
| Physical infrastructure and comfort | The appearance of the facility, cleanliness, comfort, privacy, and other aspects that are important to clients |
| Choice | When appropriate, client choice of provider, insurance plan, or treatment |

**Figure 11. Flowchart: Hospital Stay Resulting in Mortality**




## *Example 2*

## Step 6: Report the Data

The team will prepare and distribute the reports to appropriate groups. In addition to sharing the statistics, the reports should include the team's analysis of the data, conclusions, and recommendations for improving the quality of care.

## Step 7: Expand the Program

The quality team will act as a pilot for the monitoring program. After the team has functioned long enough to work out the "bugs" that crop up when monitoring the Quick Start indicators, the team can address other processes and services. The Quick Start method was limited to the hospital; however, monitoring programs can be designed to measure the effectiveness of services across the continuum of care. In this model, the quality team would include members representing the hospital, health center, and community caregivers (e.g., midwives). This integrated approach would provide a better view of the true incidence of hospital-acquired infections, since surgical infections can develop up to 30 days after the operative procedure, long after discharge from the hospital. Maternal mortality is also not specifically a hospital issue. It is a community problem for which an integrated team could investigate patient education, referral practices, transportation, and cultural issues that impact maternal mortality. This broader view will ultimately be necessary to optimize continuity of care. Figure 12 reviews the steps of the Quick Start approach.

**Figure 12. The Quick Start**

| Process | Steps |
|---|---|
| Get organized | Identify a quality coordinator<br>Form a quality team |
| Collect data | Measure infection control and mortality rates |
| Use the information and results | Compile data<br>Analyze the data<br>Report the results<br>Initiate quality improvement |

## *Preparing for a Successful Monitoring System*

To implement a new system, it is important to take into account the time, personnel, and financial resources needed to sustain the system. Quality programs may be initiated at the direction of management or through the interest and enthusiasm of staff members. Regardless of who initiates the program, the following steps provide a way to build the foundation for a quality monitoring system.

### Step 1: Obtain Support/ Commitment

#### *Elicit management support*

If the staff initiate the idea to implement a quality monitoring system, they will want to meet with key management leaders. Management, after all, provides direction and allocates resources. The agenda for this meeting might include: (a) the purpose of the meeting, (b) an explanation of a quality monitoring system, (c) the value of a monitoring system for the hospital, and (d) the type of management support needed.

#### *Identify stakeholders*

Stakeholders are individuals or groups with vested interests in the successful outcome of the activity. Stakeholders can include physicians, Ministry of Health staff, hospital staff, people from the community or formal community groups, and international agencies. It is important to identify the stakeholders at the outset by talking with staff members and meeting with key groups. In each case, discussing the purpose of the program and gaining support is critical. Learning the stakeholders' expectations will help you develop the monitoring system.

#### *Build ownership and involvement*

Finding ways to inform and involve staff is also key to success, since monitoring quality is not the work of a single individual. The output of quality monitoring may prove useless if staff do not "buy into" the need for quality measurement. The need to keep all stakeholders informed cannot be over-emphasized (see the section "Developing and Implementing a Communication Plan").

### Step 2: Organize a Monitoring System

#### *Identify a leader for the quality monitoring system*

Once the decision has been made to develop a quality monitoring system, a program coordinator must be appointed. The hospital will need someone to organize a steering committee and coordinate the quality monitoring system. Some organizations create a position for a quality assurance director who is responsible for coordinating activities. The program coordinator should have an interest in quality monitoring, the ability to organize and coordinate activities, the ability to facilitate groups, the respect of colleagues, and, optimally, some experience with monitoring.

#### *Organize the steering committee*

Committee members should be selected to represent key stakeholders. Some hospitals use a management-level steering committee; others assemble members of staff. This choice may be based on several considerations: What is the time frame for initiating the new program? Does the staff currently have the knowledge and experi-

ence to establish the foundation and priorities for the quality program? Is it feasible to free the staff from other duties in order to work on this committee? There is no right or wrong decision in this situation. The committee's job is to create a quality vision, decide on the structure of the program, conduct a situational analysis (described below), and set priorities for work. Once the monitoring system is well established, the steering committee may no longer be needed. Table 11 shows an example of a steering committee action plan.

### *Write a vision or a quality statement*

The steering committee writes a vision or quality statement that will provide a foundation for a commitment to quality service. The vision or quality statement, only one or two sentences in length, signifies that quality is important to the hospital. One hospital wrote a quality equation: Value = clinical outcomes + patient satisfaction/cost. Other hospitals have written quality statements such as, "All care and services of this hospital will be provided in a quality manner," or "Quality is priority number 1." The committee should not spend excessive time creating the perfect vision or statement. Instead, it should set the tone for the organization and clearly convey the message that quality is at the core of every level of healthcare at the hospital.

### *Develop an administrative policy regarding the quality program*

The administrative policy in Figure 13 provides the parameters for the successful implementation of the program.

**Table 11. Steering Committee Action Plan**

| Activities | Actions | Responsibility | Time |
|---|---|---|---|
| Write a vision statement | Conduct an activity to write a vision statement | Frank Lorenzo, Quality Coordinator | January |
| Develop a communication plan | Develop a communication plan | Frank Lorenzo, Quality Coordinator | January |
| Develop training program for team members | Investigate training programs in other hospitals<br>Develop training program<br>Develop training materials<br>Establish training schedule | Oscar Gomez, Education Coordinator | January |
| Design a quality management report | Conduct interviews with management staff to determine information desired in a quality management report<br>Identify ways to collect the data<br>Develop a plan to collect and compile the data<br>Design the format for the report<br>Review proposed report with management staff | Joanne Albatross, Medical Records Assistant | January |
| Organize a quality team (e.g., Maternity team) | Determine representatives to participate on the team<br>Determine method for selecting team members<br>Select team members | Juanita Uhl, Maternity Nurse Manager | February |
| Conduct a situational analysis | Develop a questionnaire<br>Identify persons to interview<br>Assign interviewers<br>Conduct interviews<br>Compile data<br>Analyze data | Frank Lorenzo, Quality Coordinator | February |

## Figure 13. Administrative Policy, Quality Monitoring Plan

**Hospital X**
**Atlantis, Oceana**
**2000**

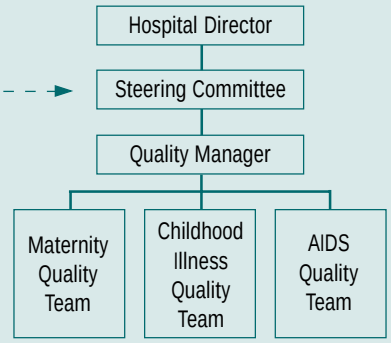
I. Vision

Hospital X is dedicated to improving the quality of care and services to its community. Quality is achieved through meeting the needs and expectations of our clients. Quality is realized through the work of multidisciplinary teams that establish scientifically based standards, continuously monitor their application, and use the results of the monitoring to improve care and services.

II. Primary Services: The priority services for quality monitoring system are:

A. Maternity care
B. Diarrhea management
C. AIDS care

III. Program Organizational Structure




IV. Roles and Responsibilities

A. Hospital Director
   1. Provides direction (quality planning)
   2. Provides supportive management actions (participation)
   3. Provides resources (personnel, training, and materials)

B. Quality Manager
   1. Oversees quality monitoring program
   2. Coordinates team meetings and activities
   3. Provides expertise in quality monitoring
   4. Trains teams and others in quality methodology
   5. Facilitates quality team processes
   6. Analyzes effectiveness of quality monitoring
   7. Facilitates quality improvement activities
   8. Facilitates communication and change processes

C. Steering Committee
   1. Provides support and guidance to the quality team
   2. Conducts a situational analysis
   3. Establishes services for monitoring
   4. Establishes reporting formats and mechanisms
   5. Assists with quality training activities
   6. Evaluates quality program
   7. Assists in change management plans and activities
   8. Assists with communication plan and implementation

D. Quality Team Members
   1. Attends and actively participates in team meetings
   2. Participates in quality monitoring and improvement activities

V. Approval Process

A. The quality team comes to consensus and drafts the standards
B. The proposed standards are submitted to the department director for approval
C. Final approval is obtained from the hospital director

VI. Quality Reports

Monthly reports of quality team activities will be submitted to the hospital director on the 10th of each month

Key items addressed in the policy are:

- **Priority Services.** It is important to understand the populations of interest. What types of patients do we serve? What are the most common diagnoses? What are our most frequently performed surgical procedures? In order to prioritize patient care services for quality monitoring, a list of the top five to ten most frequent admission diagnoses can be obtained. This is a good way to identify the high-volume services. These diagnoses can be listed across the top of the matrix as shown in Table 12. Other factors to consider when prioritizing are whether the service is high-risk or problem-prone. High-risk would indicate health conditions or services that have the potential for complications, injury, or death. Problem-prone services are identified through patient complaints, lack of compliance to standards, etc. The team can use a score of 1, 2, or 3 to identify the significance of the criteria in relation to the diagnosis/service.

  *Example:* Provincial Hospital is a 330-bed tertiary care hospital offering a wide range of inpatient and outpatient services in an urban setting. The open-heart program is the only one in the country. There is a large maternity care program and a large population of patients with AIDS. Records show that the hospital receives all the multiple trauma cases in the region, which are primarily vehicular accidents. Diarrhea and subsequent dehydration is the primary cause of pediatric admissions under the age of five. The hospital used the prioritization matrix in Table 12 to prioritize their monitoring activities. The team rated each category in terms of high-volume, high-risk, and problem-prone. The totals allowed the team to determine priorities. Based on the scores in the matrix, the team identified three priority service areas: AIDS, maternity care, and diarrhea management. Within these three areas, the largest numbers of patients admitted to the hospital were diagnosed with AIDS.

This population is at high risk due to their susceptibility to infection and death. The team also deemed AIDS as problem-prone because no standards had been developed for the management of patients with AIDS, and staff had not received education in the management of patients with AIDS. Maternity care cases and diarrhea management cases were also noted to be high-volume services. Child and maternal deaths, while not as frequent as deaths among patients with AIDS, still posed a risk. Maternity care was considered problematic as cesarean section and surgical incision infection rates were high. Diarrhea management was judged problem-prone because the availability of fluid replacement was a frequent problem.

- **Define lines of authority and communication:** Create an organizational chart for the quality monitoring program describing the reporting relationships. In addition to the hospital director, there are typically additional management personnel, such as department directors, who need to be in the communication and decision-making loop.
- **Clarify the roles and responsibilities:** For each position depicted on the organizational chart, define the responsibilities in relation to the quality monitoring program.
- **Establish an approval process:** Inasmuch as the decisions made and plans proposed by this team will have an impact on patient care and staff, it is best to outline an approval process for new standards and monitoring plans. These activities have the potential for affecting patient care, professional practice, and the use of resources. A singular standard can make a huge impact on an organization. For example, the infection control standards in the U.S. changed as a result of the advent of AIDS. Wearing gloves to provide all patient treatments, including starting intravenous fluids, was required by the Centers for Disease Control. This new standard increased the cost of care in one hospital by $100,000 per year for the purchase of gloves. Monitoring activities also require resources, and management has the responsibility of allocating those resources. Typically, the quality team will develop standards and request management approval prior to implementation. The approval process will vary between hospitals and thus needs to be outlined.

Peggy Koniz-Booher

**Table 12. Prioritization of Services**

| Prioritization Matrix – Services | | | | | |
|---|---|---|---|---|---|
| **Priority Status** | **Diarrhea** | **Multiple Trauma** | **Open Heart Surgery** | **Maternity Care** | **AIDS** |
| High volume | 3 | 1 | 1 | 3 | 3 |
| High risk | 2 | 3 | 3 | 2 | 3 |
| Problem prone | 3 | 1 | 1 | 2 | 3 |
| **Total** | **8** | **5** | **5** | **7** | **9** |

### *Develop and implement a communication plan*

A communication plan is an essential element for implementing any new program. Planning for communication is an ongoing process. After each meeting of the monitoring team, the leader should ask, "Do we need to communicate any information resulting from this meeting?" If so, the monitoring team should develop an immediate plan. Communication is important when initiating the program, and it is equally important to plan for the distribution of monitoring information. Monitoring results should be reported to those healthcare providers who are most able to impact on and improve patient care. Reporting should be done on a systematic, ongoing basis to ensure that information sharing is timely. The following actions provide a structure for communication planning:

- **Identify target populations.** The target populations include the groups, both internal and external, that will be affected by the new program or the results of the monitoring. Internal target populations include staff and physicians. External targets include the Ministry of Health, district supervisors, and other healthcare organizations that are involved in some capacity with the hospital. The public also has the right to know about the quality of care provided in a particular institution.
- **Determine the message.** Most people will want to know how the program or findings will affect them. For instance, physicians will want to know whether the new program requires additional documentation. To gain support, the team should explain the advantages of additional documentation to the physicians (e.g., the data will help them improve patient care). The monitoring findings will prove important to all staff in addressing problem areas and finding ways to improve care.
- **Establish the means for delivering the message.** The monitoring team should take advantage of established lines of communication (e.g., monthly staff meetings). However, although the monitoring team can deliver some messages in meetings and memos, at times one-to-one communication may yield more positive results. When reviewing the findings of monitoring, visual displays using graphs, charts, or tables will be useful. The idea is to report monitoring information in a manner that improves the process or outcome being measured.
- **Identify the person responsible for delivering the message.** Unless the monitoring team assigns a specific person to deliver the message, the message might not be received. Ideally, the team should make one person responsible for sending the message (even if other members of the team will also be involved). The individual selected for the task must be suitable for the individual or group that is being addressed. For instance, if monitoring findings will be reported to a group of physicians, an appropriate person to deliver the message would be a respected member of the medical staff.
- **Establish a time frame for delivering the message.** No plan can be created without a schedule for communicating information. The time frame should be reasonable and take into account the time considerations of the target populations. For example, if the monitoring team needs to communicate information to the staff working on the night shift, a team member needs to meet with the staff when they are on duty, rather than attempting to meet with them during their off hours.

Table 13 is a sample communication plan to inform targeted populations about the quality monitoring system and the monitoring team.

**Table 13. Communication Plan**

| Target Population | Message | Means of Delivery | Person Responsible | Time Frame |
|---|---|---|---|---|
| Hospital staff | ■ Discuss hospital commitment to quality<br>■ Describe program<br>■ Describe impact on quality of care and staff | Inservice training held on each shift | Ellen Jones, Education Coordinator | January 2000 |
| Physicians | ■ Explain purpose of the QA monitoring system<br>■ Introduce the team members<br>■ Describe what the physicians can expect from the program<br>■ Ask the physicians for their support | Presentation at monthly medical staff meeting | Saeed Meky, QA Director | January 15, 2000 |
| Ministry of Health | ■ Describe program plan<br>■ Describe anticipated results of the program | Meeting with the MOH and area supervisors | Joe Garcia, Director of the Hospital | January 21, 2000 |
| International Organization X | ■ Describe program plan<br>■ Discuss areas where collaboration is possible | Meeting with Joy Mayo, Program Director of International Organization X | Saeed Meky, QA Director | February 1, 2000 |

### *Conduct a Situational Analysis*

The answers to the questionnaire in Figure 14 can be used to determine the current situation vis-à-vis quality monitoring at the hospital.

Using the information obtained through the questionnaire, the steering committee can conduct a force field analysis to determine those factors that will facilitate or constrain the implementation of the quality monitoring system. This information will be used to develop an action plan. Table 14 shows an example of a force field analysis.

An action plan can be developed from the information derived from the force field analysis. Table 15 shows an example of an action plan.

### *Organize a quality team*

Careful selection of team members is critical to success. Team members represent each phase of the process being monitored. For example, infection control involves physicians, nurses, laundry staff, respiratory therapy, and cleaning staff. Criteria for selection should include both

**Figure 14: A Situational Analysis of a Hospital's Current Monitoring Mechanisms**

The following questions can provide a useful self-assessment for a hospital in conducting a situational analysis of its quality monitoring mechanisms:

- What is the historical approach to monitoring in the hospital?
- What infrastructures (quality department, quality teams) exist to implement a monitoring system? What is working well?
- What is the scope of the current quality monitoring activities? Are written standards available in the hospital, Ministry of Health, or district offices? What standards currently exist?
- Are these standards based on current research? Are staff aware of the standards? Is there compliance with the standards?
- Are data collected in the hospital (e.g., statistics related to types of diseases, operations)?
- Are data collected related to processes carried out?
- What types of data are collected? What types of reports are generated? Who receives the reports and what are they used for? Are data used for making decisions about healthcare services?
- Are there meetings during which the data are shared and discussed?
- Is any action taken upon the data that has been collected?
- Who is involved in the process?
- How receptive is the staff to the activities?

**Table 14. Force Field Analysis of Factors Affecting the Implementation of a Quality Monitoring System**

| Facilitating Factors | Constraining Factors |
|---|---|
| Ministry of Health standards exist for obstetrical services including normal delivery, postpartum care, and managing complications | No standards exist for other patient classifications (AIDS, diarrhea management) |
| The hospital director is very supportive of the quality program and has attended quality management workshops | The staff have no training in quality monitoring |
| Data are currently collected monthly for maternal mortality, rates of common illnesses treated, and surgical cases | There is no current analysis of the data collected or actions taken based on the data that might improve quality |
| A new computer has been purchased for the medical record department | No data is collected regarding processes |

**Table 15: Action Plan Based on Force Field Analysis**

| Activity | Responsible | Date |
|---|---|---|
| Develop a quality reporting format | Steering Committee | March 2000 |
| Investigate the availability of software for the monitoring system | Hany Askov, Medical Record Staff | March 2000 |
| Obtain copies of the obstetrical standards from the Ministry of Health | Ya-shin Lin, M.D. | March 15, 2000 |
| Search literature for current standards related to care of patients with AIDS and diarrhea | Nadia Musa, Auxiliary Nurse | March 15, 2000 |
| Involve the hospital director in quality awareness programs | Maritza Gomez, Nursing Supervisor | June 2000 |
| Plan training courses for targeted staff in quality monitoring | Dan Opoku, Education Department | June 2000 |
| Use the current data available in medical records as a foundation for future data collection | Hany Askov, Medical Record Staff | As indicated |
| Develop a process for analyzing data | Quality Team | As indicated |

the willingness to participate in a team along with the knowledge, experience, and time available to contribute to the effort. A team must consist of at least three members, but not more than ten. Six to eight members are optimal. When the team meets for the first time, the agenda will include:

- Setting groundrules
- Selecting a recorder of minutes
- Determining a meeting calendar, including dates, times, and locations
- Agreeing on a means of voting or establishing consensus regarding decision making

### *Develop a training program for the team members*

Functioning as a team may be a new experience for the group and the methodology will be new. Thus, a training program will need to be provided to assist the members to not only function in a team but also learn quality monitoring.

### *Design a quality management report*

The team will need to talk with the management staff to determine what type of information they desire from the group. Often management reports include a collection of data but not an analysis or recommendations. The work of the quality

teams will be to collect, analyze, and recommend improvements in quality. The format of the management report should reflect this approach.

## *Monitoring Key Processes*

Rather than develop new standards, a monitoring team can identify existing standards. The team can either accept these standards as written or revise them.

### Step 1: Identify Key Processes

As pointed out in the framework in Figure 1, key processes may refer to hospital activities (e.g., admission) and specific processes used to manage patient care (e.g., diagnostic tests and treatment). Most patients admitted to a hospital undergo all of these processes. The team will discuss each process in relation to the particular service under consideration. For instance, the quality team considered the various inputs and processes involved within the maternity department:

- Admission: Were qualified staff available to receive and treat the patient? What are the experiences of women in labor when being admitted to the hospital? How are emergency admissions handled?
- Medication administration: Are there adequate medications to meet patient needs? Are protocols being followed for managing labor-inducing drugs? How is pain managed?
- Diagnostic procedures: What types of diagnostic procedures are conducted in the maternity department? Is the equipment available and functional? Are there competent people to perform the tests? Are the results available in a timely manner?
- Treatments and procedures: What are the typical treatments and procedures performed in maternity? Normal deliveries? Cesarean sections? What are the experiences of mothers in postpartum? Are the needs and expectations of the mothers and families being met?
- Nursing care: Is nursing care provided according to established protocols and procedures? Are there concerns related to the assessment, planning, implementation, or evaluation of patient care?
- Patient and family education and counseling: Are patients and families receiving education and counseling regarding home management? Are the education materials appropriate for the populations served?
- Medical records: How well is information documented in the medical record? How much time does staff spend to document patient care? Are previous medical records brought to the ward rapidly?
- Infection control: What are the infection control rates for cesarean sections? Are there other infection control issues?

### Step 2: Prioritize Processes to Monitor

Each quality team will prioritize processes to monitor. For instance, the maternity monitoring team prioritized the processes to monitor as those that are high-volume, high-risk, or problem-prone. The monitoring team listed the processes in a matrix similar to the one shown in Table 16. High-volume processes are the most frequently occurring processes. To identify high-risk processes, the team rated the processes with the most potential for harming the patient. Next, the team identified problem-prone processes based on patient complaints received and other problems for which the team had knowledge. The monitoring team rated each process with a score of 1, 2, or 3—with 3 signifying the highest priority. The total scores identify the processes most in need of monitoring. Using the ratings in the sample matrix, the hospital can begin to monitor medication administration and infection control standards.

**Table 16. Maternity – Priority Matrix**

| Core Processes | Priority Status: High-Volume | High-Risk | Problem-Prone | Total |
|---|---|---|---|---|
| Admission process | 3 | 2 | 2 | 7 |
| Medication administration | 3 | 3 | 3 | 9 |
| Diagnostic procedures (e.g., intrauterine monitoring) | 2 | 3 | 3 | 8 |
| Treatments: pain management | 2 | 2 | 2 | 6 |
| Nursing care | 3 | 1 | 1 | 5 |
| Patient and family education and counseling | 3 | 1 | 1 | 5 |
| Medical records: documentation | 2 | 1 | 2 | 5 |
| Infection control: cesarean section | 3 | 3 | 3 | 9 |

**Table 17. Annual Monitoring Plan**

| Indicator | 1st Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter |
|---|---|---|---|---|
| Infection control: surgical incisions | X | X | X | X |
| Mortality rates | X | X | X | X |
| Medication errors | X | | | |
| Patient falls | | X | | |
| Patient education at discharge | | | X | |
| Diarrhea management | | | | X |

Sentinel events, e.g., unexpected deaths: Assess the situation immediately after the occurrence.

## Step 3: Establish an Annual Monitoring Plan

The quality team would find it beneficial if an annual monitoring plan were established that identified the indicators that would be monitored on an ongoing basis and the indicators that would be monitored for one or more quarters during the year. One factor to consider is the number of cases/patients/occurrences during a period of time. For example, a clinical procedure that is performed only once a quarter may need several quarters to provide a sufficient number of cases for performance evaluation. Conversely, very high-volume procedures may only require a single week to accumulate enough cases for performance to be reliably evaluated. Table 17 is an example of such a monitoring plan. In this plan, infection control and mortality rates are ongoing measures, whereas the team will monitor medication errors during the first quarter, patient falls in the second quarter, patient education in the third quarter, and diarrhea management in the fourth quarter. If the results of the

monitoring indicate that standards are being met, no further action will be taken. If standards are not being met, the team will make decisions regarding actions to take and decide when to remonitor in order to evaluate whether an improvement has been made. Occasionally, an event (often referred to as a sentinel event) may occur that has such a significant consequence on patient safety and healthcare that it requires immediate evaluation and follow-up. Unexpected patient deaths are an example of a sentinel event.

## Step 4: Develop Flowcharts

A flowchart describes the steps and selected outcomes of the processes chosen for quality monitoring. In the example for the Quick Start, the monitoring team's data indicate a high infection rate among patients with cesarean sections. Since cesarean sections are high-volume processes that present a moderate risk to a patient and put the patient at risk of infection, the team should start monitoring postoperative cesarean section patients using the flowchart as depicted in Figure 4. Flowcharts can be developed through brainstorming and written standards can also provide information regarding the expected process. The flowchart in Figure 15 depicts a process for administering medications. If the team decides to monitor medication administration, it would start by developing the process flowchart. The team might then brainstorm the various factors that impact on the quality of administering medications. Next, the team would determine whether standards exist for medication administration, e.g., policies and procedures for handling medications. *(For examples see Appendix 6, Pharmacy Department: Errors: Medication; and Appendix 7, Procedure: Medication Errors.)* If standards do not currently exist within the country, the team would seek out standards written in other countries, through a literature review, Internet search, or phone calls to colleagues or organizations. Standards that are located

**Figure 15. Medication Administration Flowchart**

***Patient Flow***

| Physician Order for Medication | Pharmacy Fills Order | Medication Delivered to Ward | Nurse Administers Medication | Follow-up |
|---|---|---|---|---|
| Was the physician's order legible?<br>Was the correct medication ordered for the condition?<br>Was the correct order sent to the pharmacy? | Was the medication within the expiration date?<br>Was the medication available in the pharmacy?<br>Was the order filled correctly? | Was the medication delivered to the ward promptly?<br>Was the medication stored properly when delivered? | Was the correct medication administered?<br>Was the correct dose given?<br>Was the dose given at the correct time?<br>Was the medication given to the correct patient?<br>Was the medication given by the correct route, e.g., oral?<br>Was the medication documented according to standards? | Was the patient assessed for response to the drug?<br>Were reactions recognized and treated appropriately?<br>Did the patient/family receive medication teaching? |

Cousins, D.D. 1998. Medication use: A systems approach to reducing errors. Joint Commission on Accreditation of Healthcare Organizations.

may be adapted or adopted for use (refer to resource list). If all else fails, the team may need to develop new standards. Using the standards, a monitoring tool would be developed to measure some or all of the factors related to quality medication administration. If the monitoring reveals that standards are being met, the team might decide to remonitor at a later date, e.g., in six months or a year. If standards are not being met, the team will initiate quality improvement.

## Step 5: Determine the Scope of Monitoring

The scope refers to whether the monitor will address the total process of the intervention (inputs, processes, and outcomes) or only one or two parts of the process, such as treatments. For example, the surgical site infection rate is an outcome measure. When the infection rate exceeds the threshold, the team will likely choose to measure selected inputs and processes. Inputs would include the materials and supplies used to maintain infection control (e.g., gloves and disinfectant). Processes include such interventions as surgical scrub procedures, antibiotic prophylaxis timing, and surgical preparation procedures.

In the Quick Start, the monitoring team found that postoperative infection rates were higher than they should be among patients undergoing cesarean sections. The monitoring team developed a process flowchart and discussed probable sources of the problem. Since monitoring each step of the process is time consuming and complicated, the team considered the infection control process and the various factors that might contribute to the increased infection rates (e.g., sterilizing equipment, sterile scrubs, and maintaining a sterile environment). The team then instituted a spot check for a specific activity: the sterile scrub.

The team investigated whether standards for performing a sterile scrub existed within the hospital or at the central level. Since they could find no written standards for this procedure, the team reviewed current standards in medical literature and used them to develop their own procedure.

The monitoring team also reviewed its membership to determine whether they had adequate representation from each profession responsible for infection control. The monitoring team asked, Who is responsible for performing sterile scrubs and providing the materials (inputs) needed to perform the scrubs? Infection control will not be the sole responsibility of the monitoring team. Other staff members—e.g., the nurses, physicians, surgical technicians, and other staff responsible for stocking the inputs, such as disinfectant soap and hand brushes—will also have significant roles in the process.

After the monitoring team developed a sterile scrub procedure, it sought consensus for using the process.

## Step 6: Develop Performance Indicators

Performance indicators tell the monitoring team how well the standard is being met. (See the section on indicators in "Characteristics of a Quality Monitoring System.") When developing indicators, the monitoring team must make certain that the necessary data will be easily available.

The team should ask, "What information is needed to compute the indicators?" If the process to be monitored includes numerators and denominators, they must be expressed and defined explicitly. For surgical wound infection rates, the computation requires knowing the number of surgical wound infections that developed after surgery (the numerator) and the total number of patients who had surgery (the denominator). This, then, is the outcome indicator for surgical infections. The size of the sample will affect the interpretation of the data. It should be noted that a rate can be accurate and consistent, but still not useful or interpretable if the numerator (infrequent event) or denominator is too small. Sometimes, it is better to accumulate sufficient numbers prior to calculating

rates. Generally, 30 or more procedures are considered a sufficient number of procedures for determining a rate. High-volume procedures (more than 50 per month) can be reported monthly, but quarterly or biannual reporting is more appropriate for less commonly performed procedures.

Sample surgical infection indicators for inputs and processes are shown in Table 18. For example, the proportion of surgical staff who had disinfectant soap available (the input) provides information about the materials available to control infections. The proportion of surgical staff who scrubs their hands according to standards before surgery (the process) provides information on how well the staff carries out this procedure. The proportion of patients who develop surgical wound infections (the outcome) provides information on the effectiveness of infection control measures.

## Step 7: Develop Monitoring Strategies

Another question the team should ask is "What are the sources of information?" Various strategies can be used to collect data. Concurrent data collection (collecting data at the time of occurrence) can be very effective, although it is often not possible. Some hospitals choose this method to evaluate activities that would be difficult to evaluate from reviewing records such as emergency responses. In these cases, someone may be assigned to observe the emergency intervention and provide immediate feedback to the team. Daily observations of wound infections are another example of concurrent monitoring. Prospective (after the fact) data collection is one of the most frequently used means of collecting information. In this method, data is collected over a specified period of time (e.g., one to three months) and is often gleaned from the medical record or hospital logs. A point prevalence survey (a

**Table 18. Indicator for Surgical Scrub Infection Rates**

| Indicator | Formula | Data Source for Numerator | Data Source for Denominator | Person Responsible for Collecting Data |
|---|---|---|---|---|
| Surgical scrub procedure | Number of staff who completed the surgical scrub according to the procedure / Total number of staff who should have completed a surgical scrub | Surgical scrub data collection tool | Surgical scrub data collection tool | Martha Jackson and Ralph Maize, QA team members |
| Surgical scrub inputs | Number of times the inputs (disinfectant soap, hand brushes, and clean towels) were available for the surgical scrub / Total number of observations made | Surgical scrub data collection tool | Surgical scrub data collection tool | Martha Jackson and Ralph Maize, QA team members |

Instructions: Make observations between 6 a.m. and 7 a.m. every morning, Monday through Friday, for the first two weeks of July. Complete the surgical scrub collection tool for every staff member who should perform a surgical scrub.

specific point in time) may be useful when resources are limited (e.g., a survey of all patients' hospitalized on surgical wards on a specific date).

Choosing a strategy is determined by the most effective means of collecting the data, as well as the most feasible means. Sometimes the team will need to select a less effective method on account of a lack of resources for data collection.

When possible, using a data collection tool that has already been tested is preferable. When data collection tools are unavailable, the monitoring team will need to develop their own means for data collection. The easiest format for monitoring protocols and procedures is to use questions that can be answered with "yes," "no," and "not applicable." An example of a monitoring tool is shown in Figure 16. Open-ended questions are more appropriate for obtaining information regarding patient satisfaction in focus groups or during patient interviews. However, open-ended questions also are an effective means of determining a patient's knowledge about their care and treatment. Designing complicated data collection strategies can be fatal to the monitoring system. If the data are not reliable, decisions cannot be made. If the data are too difficult to obtain, the monitoring team may have problems finding time to collect the data, which might cause team members to lose interest in the process.

Since data collectors need to be trained, the instructions for completing the data collection tool must be well defined and clear. It is also helpful to ask the data collectors to pilot the tool so that clarifications in filling out the tool may be made prior to the formal data collection. Having the collectors use the tool at the same time can test the reliability of the tool. For instance, when making the observations of the sterile scrub procedure, two data collectors would make observations at the same time. They would then compare their evaluations to determine whether they marked the same items. If not, additional clarification and training are warranted.

In the case example, once the sterile scrub procedure was developed, it was easy for the team to develop a monitoring tool. They used the sterile scrub procedure to make a checklist so that a single observer could easily evaluate each step of the procedure, as well as the inputs (soap, hand brushes, and towels).

Two methods can help to monitor sterile scrubs, as follows:

### *Direct observation*

Direct observation is an effective way to measure performance in a working environment, is easy to integrate into a supervision schedule, and can evaluate a full range of competencies, including interpersonal skills. In this approach, a supervisor or other staff member observes the actions of a healthcare worker and evaluates his or her performance against the standards written for the task. For instance, the quality team used the tool in Figure 14 to make observations about a worker's ability to meet the sterile scrub procedure. The presence of the observer, however, may influence the healthcare worker's performance in either a positive or negative way.

### *Inspection*

A supervisor can use a checklist to evaluate the availability of medications (e.g., the number, type, and expiration dates) or the function of equipment (e.g., a defibrillator). An inspection of cleanliness might include visits to patient rooms, laundry areas, and kitchens. As an example, the quality monitoring team used inspections to determine whether inputs (e.g., disinfectant soap and hand brushes) were available for sterile scrubs. The monitoring team completed the inspection at the same time as the observation and included the inspection results in the observation guide.

Additional data collection methods may be used based on the standards that will be monitored:

## Figure 16. Sterile Scrub Procedure Monitoring Tool

Directions: Use one form for each observation. Observe the staff member perform the sterile scrub procedure. For each activity of the procedure, make a check mark in the right hand column indicating whether the activity was completed as described (yes) or not (no). Numbers 20-22 are marked according to the availability of the products needed for the sterile scrub.

| Activity | Performed procedure Yes | No |
|---|---|---|
| 1. Remove jewelry. | | |
| 2. Wet hands and arms to elbows. | | |
| 3. Apply antiseptic soap to the hands and work up lather. | | |
| 4. Clean under nails with scrub brush and discard. | | |
| 5. Rinse hands and arms thoroughly. | | |
| 6. Obtain new scrub brush and apply antiseptic soap to the brush. | | |
| 7. Start at fingernails and scrub the nail area, one hand for 30 seconds. | | |
| 8. Scrub fingers, all 4 sides, including webbed spaces between fingers for 30 seconds. | | |
| 9. Scrub the palm and dorsal surface of the hand for 1 minute. | | |
| 10. Scrub arm to 2 inches above the elbow, 4 sides for 30 seconds each side. | | |
| 11. Repeat steps for the other hand and forearm. | | |
| 12. Discard scrub brush in waste receptacle. | | |
| 13. Rinse fingers, hands, and arms beginning at the fingertip and advancing to the forearm, hold hands higher than elbows to force water to run down away from hands. | | |
| 14. Remove hands and arms from the running water holding arms bent, upright away from hands. | | |
| 15. Grasp a sterile folded towel near the corner and step away from all equipment. | | |
| 16. Extend arms and open towel to full length and width. | | |
| 17. Use half of the towel to blot dry one hand, a circular motion to dry forearm to elbow. | | |
| 18. Repeat with other arm using the other half of the towel. | | |
| 19. Discard towel by dropping into linen receptacle. | | |
| 20. Was disinfectant soap readily available? | | |
| 21. Were sufficient hand brushes available? | | |
| 22. Were there sufficient sterile or paper towels available? | | |

### *Exit interviews*

In an exit interview, an interviewer asks a patient to describe what happened during the hospitalization. The interviewer uses a checklist requiring positive or negative answers or asks open-ended questions about the patient's degree of satisfaction, quality of care, or level of knowledge. For instance, a question might be, "What do you need to do to care for your incision after you go home?" If the patient is a child, the interviewer asks the questions of the accompanying caretaker. Although this method does not disturb the interaction

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between the patient and healthcare provider, it may subsequently influence the provider's performance.

The quality of the information may be limited by the patient's observation ability, understanding of the situation, and memory of the hospitalization. The reliability of the information may be decreased because many patients consider expressions of dissatisfaction to be discourteous. Some studies show a difference between the information that patients provide in an interview before discharge and the information they provide during focus group discussions. The monitoring team may choose to use a questionnaire as an alternative to interviewing patients. In developing countries, however, a questionnaire may have limited value if the clients are illiterate or speak another language—or if there is unreliable mail service.

### *Review of records*

Information about compliance with standards might be available in medical records, reporting forms for the health information system, logbooks, or any document containing information on patients' health problems. For example, if the monitoring team needed to assess compliance with the protocol for care of a patient with a postpartum hemorrhage, the team could review charts to determine whether the staff documented the steps of the protocol in the patient's record. A supervisor can conduct the chart review, but because healthcare staff are more directly aware of problems, they should be actively involved with the problem-solving activities of the review.

This method, however, has serious limitations. The information found in medical records in developing countries is usually limited to symptoms, diagnosis, treatment, and, at times, is poorly documented. Unless medical records are well designed, sufficiently detailed, and accurate, they will not permit an assessment of the process of care. In these cases, direct observation may be the most effective way to obtain the information.

### *Mystery patients*

The monitoring team may also obtain information unobtrusively by using a mystery patient (a person asked to visit the hospital anonymously, experience a process, and provide an account of the experience). This is a good method to evaluate admissions procedures. For example, the monitoring team could ask the mystery patient to notice how he or she was greeted upon entering the hospital and what happened during registration and initial interviews. However, this method may be time-consuming, expensive, impractical, or culturally unacceptable.

### *Focus group discussions*

A focus group is another excellent means of soliciting information about the client's needs and expectations. The monitoring team can convene a homogeneous group (e.g., former patients, family members, physicians, or other healthcare workers) to discuss healthcare issues. Skilled interviewers may not be available. A practical option would be to have the monitoring team conduct the focus group interview with some assistance in developing questions and guidance in interviewing techniques.

Each method has advantages and disadvantages; no single method is adequate for all situations. The monitoring team might find a combination of methods to be more reliable. The selection of the most effective methods will depend on resources available (e.g., time), the data collector's familiarity with the method, and the information that the monitoring team is seeking. The monitoring team should identify the most feasible data collection tools for each indicator.

## Step 8: Compile and Analyze the Data

As described in the Quick Start method, the data must be compiled and analyzed. The manner in which the data is compiled will depend on the data collection method. Questionnaires with yes and no responses are easier to tabulate than information obtained through a focus group. Data must be organized in a way that it is easily interpreted. Visual displays such as charts, graphs, and tables help the staff interpret results of the monitoring. Showing results from previous data collections, and noting the threshold on the graphs, provides a comparison from which to draw conclusions. Figure 16 shows the results of the sterile scrub procedure monitoring.

When calculating the results based on the indicators, the first indicator was measuring compliance to the surgical scrub. Because there are various steps to the procedure and varying degrees of compliance, the overall compliance rate is based on the steps involved in the scrub (steps 1–19). In order to calculate the overall compliance rate, the team added up the score in the "yes" column for steps one through 19 (1,725 "yes" observations) and divided that number by the total number of observations for each step (125 observations multiplied by 19 steps equals 2,375 total observations). Thus, the compliance rate was 1,725 "yes" observations divided by 2,375 total observations multiplied by 100 to equate to a 73 percent rate of compliance. It is possible to calculate compliance to each of the steps as demonstrated in Figure 16. Knowing the rates of compliance for each step permitted the team to focus on specific areas that needed improvement. The second indicator was the number of times the inputs (disinfectant soap, hand brushes, and clean towels) were available for the surgical scrub divided by the total number of observations made. In this case, there were three inputs (questions 20, 21, and 22) that also can be calculated separately as shown in the last 3 rows of Figure 16.

What conclusions can be drawn from the tabulation of the data from the sterile scrub monitoring activity? First, the areas most deficient are related to the use of sterile towels. Staff completed this activity only 20 percent of the time. With the additional information that sterile towels were only available 20 percent of the time, the team concluded that the problem was insufficient availability of sterile towels. Other problems were noted including the removal of jewelry, cleaning under nails, the hand and forearm scrub procedure, and proper disposal of the towel. This monitoring tool provided sufficient information to specifically pinpoint areas for improvement. The team was able to move to developing an action plan for quality improvement. After implementing the improvement plan, which would likely include reviewing the surgical scrub procedure with staff and providing sufficient towels, the team will re-measure compliance with the procedure to determine whether improvements have resulted from the interventions. In addition, the team will continue to monitor the surgical infection rates. They may find that the improvement in compliance to the surgical scrub procedure reduces the infection rates. If not, additional monitoring will need to be conducted in relation to other aspects of the infection control process to determine other potential sources for the increased infection rates.

## Figure 17. Sterile Scrub Procedure Monitoring Results

| Activity | Performed procedure Yes | No | Percent Compliance |
|---|---|---|---|
| 1. Remove jewelry. | 100 | 25 | 80% |
| 2. Wet hands and arms to elbows. | 125 | 125 | 100% |
| 3. Apply antiseptic soap to the hands and work up lather. | 125 | 125 | 100% |
| 4. Clean under nails with scrub brush and discard. | 75 | 50 | 60% |
| 5. Rinse hands and arms thoroughly. | 125 | 125 | 100% |
| 6. Obtain new scrub brush and apply antiseptic soap to the brush. | 125 | 125 | 100% |
| 7. Start at fingernails and scrub the nail area, one hand for 30 seconds. | 85 | 40 | 68% |
| 8. Scrub fingers, all 4 sides, including webbed spaces between fingers for 30 seconds. | 85 | 40 | 68% |
| 9. Scrub the palm and dorsal surface of the hand for 1 minute. | 125 | 125 | 100% |
| 10. Scrub arm to 2 inches above the elbow, 4 sides for 30 seconds each side. | 125 | 125 | 100% |
| 11. Repeat steps for the other hand and forearm. | 125 | 125 | 100% |
| 12. Discard scrub brush in waste receptacle. | 125 | 125 | 100% |
| 13. Rinse fingers, hands, and arms beginning at the fingertip and advancing to the forearm, hold hands higher than elbows to force water to run down away from hands. | 100 | 25 | 80% |
| 14. Remove hands and arms from the running water holding arms bent, upright away from hands. | 80 | 45 | 64% |
| 15. Grasp a sterile folded towel near the corner and step away from all equipment. | 25 | 100 | 20% |
| 16. Extend arms and open towel to full length and width. | 25 | 100 | 20% |
| 17. Use half of the towel to blot dry one hand, a circular motion to dry forearm to elbow. | 25 | 100 | 20% |
| 18. Repeat with other arm using the other half of the towel. | 25 | 100 | 20% |
| 19. Discard towel by dropping into linen receptacle. | 100 | 25 | 80% |
| 20. Was disinfectant soap readily available? | 125 | 125 | 100% |
| 21. Were sufficient hand brushes available? | 125 | 125 | 100% |
| 22. Were there sufficient sterile or paper towels available? | 25 | 100 | 20% |

Data were collected from July 3-14, 2000 (daily from Monday through Friday from 6 a.m. to 7 a.m.). A total of 125 observations were made. The highlighted boxes point out steps of the process that do no meet threshold and thus require problem solving by the team.

## Step 9: Initiate Quality Improvement

The need for monitoring is undisputed and fundamental. However, monitoring can become the principal activity of the team, leaving little time for finding ways to improve the situation. The monitoring team can follow two strategies for introducing quality improvement. Both of the methods that follow have proven successful in improving the quality of healthcare and services.

### *Problem Solving*

The problem-solving methodology is the means for identifying and ranking the importance of problems. Once the

monitoring team selects a problem for resolution, the team goes on to investigate the causes of the problem, so that the solution eventually selected will offer the greatest chance of resolving the problem.

### *Process Improvement*

The monitoring team should use process improvement when the problem is significant and the team believes that a more in-depth review of the whole process is warranted. Thus, instead of solving singular problems, the whole process is reconsidered for improvement.

The key steps in the monitoring processes are reviewed in Figure 18.

**Figure 18. Key Steps in Monitoring Processes**

1. Identify key processes
2. Prioritize processes to monitor
3. Establish an annual monitoring plan
4. Develop flowcharts
5. Determine scope of monitoring
6. Develop performance indicators
7. Develop monitoring strategies
8. Compile and analyze the data
9. Initiate quality improvement

# *Appendix 1: Use of Specific Standard Formats*

## Description and Use of Healthcare Standards

The taxonomy described various formats for writing standards. Facilities typically use a variety of these formats based on the user and the application. Thus, it is not a matter of selecting a single format for developing standards. For instance, clinical practice guidelines have been developed primarily by physicians to guide their practice, while protocols and procedures have been designed for more general use by healthcare professionals. Clinical pathways is a multidisciplinary approach to writing and implementing standards that were originally designed for use in hospitals but are now being applied to other settings. The group designated to develop standards will want to consider who will be using the standards, in what setting, and for what purpose. Some organizations have identified their key population—as well as common procedures—in order to prioritize and plan their process for standard development. For example (see insert marked "Example" on page 35), one hospital focused on the high volume of patients undergoing cesarean sections.

## Administrative policies

Administrative policies are written at both an organizational and departmental level. For instance, organizational administrative policies often include the following elements:

- Description of organizational setting: location, type of facility
- Purpose of organization
- Mission statement
- Objectives of organization
- Organizational chart
- Hours of operation
- Healthcare services available
- Staff: types (physicians, nurses, technicians), utilization, medical staff body, management job descriptions
- Ethical/legal issues: employee drug abuse policies, professional licensure requirements, and scope of practice
- Patient safety: infection control, visitor policies, and disaster/fire policies

Organizational policies are written to cover issues that effect the whole organization and staff. In contrast, each department (pharmacy, nursing, and laboratory) will have department-specific policies. The elements included in these policies might be:

- Description of department
- Organizational chart
- Hours of operation
- Services available
- Staff: types, utilization, staff job descriptions
- Specific department policies, e.g., medication administration

Department policies complement the organizational policies and may be more specific. For instance, the visitor policy for the hospital may be between 8 a.m. and 8 p.m., however, the visitors' policy in the critical care unit may be more restrictive or additional standards may be outlined for family members visiting the maternity ward.

## Algorithms

Algorithms are written in the format of a flowchart or decision tree. This format provides a quick visual reference for responding to a situation. For instance, algorithms are effective in emergency departments and critical care units. When staff are faced with an emergency, such as a patient hemorrhaging, they can treat the patient rapidly by following the algorithm.

## Clinical pathways

Clinical pathways provide the details of daily care for a specific diagnosis. The unique feature of clinical pathways is that they provide a day by day standardized plan of care. These plans are most often multidisciplinary so that care or treatment carried out by physicians, nurses, and therapists are all on the same form. The advantage of this format is that the patient's progress is monitored daily according to the expected standards. When the patient does not progress according to plan, an assessment can be made immediately and the "variance" reviewed. The patient may not be progressing due to problems in the system; e.g. the medication was not delivered. Or it may be, as a result of a problem such as the patient did not tolerate the medication. Regardless of the cause, the healthcare providers can intervene.

## Clinical practice guidelines

Clinical practice guidelines are typically physician-generated recommendations to assist practitioners in providing appropriate healthcare. The guidelines are evidence-based (based on current research) and unlike other types of formats that provide a step-wise approach to care and treatment, the guidelines provide information regarding the most effective treatments. Physicians use this information along with their experience and knowledge of the patient to determine the appropriate plan of care.

## Procedures

Procedures are step-by-step instructions on how to perform a technical skill. This format often involves the use of equipment, medication, or treatment. Examples of procedures include how to administer blood, insert tubes (nasogastric, urinary catheters), medication administration (oral, rectal, intravenous), administration of tube feedings, suctioning, and wound care.

**EXAMPLE**

The following explanation is an example of the kinds of decisions that need to be made in developing standards:

Administrative policies might address the following:

- Who can perform a cesarean section? The administrative officers will need to decide the qualifications for performing the procedure, e.g., can all physicians perform the procedure or only obstetricians?
- Where can cesarean sections be performed? Decisions need to be made regarding the use of general surgical suites for this purpose or whether there will be a dedicated obstetrical surgery.
- Is this service available to all women requiring a cesarean section? This decision would be based on the level of service available at the facility. The administrative officers will determine whether the resources (trained personnel and equipment) are available to manage high-risk cases.

A sample might look like: "Cesarean sections may be performed by physicians credentialled in surgical procedures, both general surgeons and obstetricians. An operating room within the general surgery will be designated and equipped for the management of cesarean sections. Patients who require invasive monitoring or intensive care management will be referred and transported immediately to X Regional Hospital and accompanied by a physician."

The team in this example obtained clinical practice guidelines (www.guidelines.gov) from the National Guideline Clearinghouse regarding "Practice guidelines for obstetrical anesthesia"; "Prevention, diagnosis, and treatment of failure to progress in obstetric labor"; and "Elective repeat cesarean section." The guidelines were communicated with the medical staff and used to guide medical practice.

The medical staff also developed a set of standing orders regarding the emergency management of pre-eclampsia, eclampsia, and fetal distress. The orders included such items as interventions for treating convulsions.

A multidisciplinary team discussed the need for standards regarding the normal postoperative care and management as well as management of complications. They discussed the idea of implementing clinical pathways. They decided to develop a clinical pathway for the normal postoperative care and management. They further decided to develop algorithms for the emergency management of pre-eclampsia, eclampsia, and fetal distress. The algorithms provided a quick visual diagram of how to treat the patient based on the presenting signs and symptoms. These algorithms were posted on the walls of the consultation rooms.

The team decided to develop protocols for prevention and management of phlebitis and a protocol for patient and family education. In addition, various procedures were deemed important including intravenous catheter insertion, urinary catheter insertion, and fetal monitoring. Consequently, there is no single "best" way to develop standards; the team will want to review their needs and the options before deciding which format best serves their needs.

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## Protocols

Protocols define patient care management for specific situations or conditions. Protocols may be written for the care of patients who have indwelling tubes (nasogastric, urinary catheter). Thus, the procedure would describe how to insert the tube and the protocol would describe how to care for the patient with a tube in place.

Standards might include how often to assess the patient, what to assess, and what types of treatments are needed. Protocols may also be written for patient categories, e.g., maternity care. Protocols would outline prenatal care, postpartum care, as well as emergency care such as pre-eclampsia or premature labor.

## Standing orders

Standing orders are a set of physician orders pre-established and approved to allow nurses or other professionals to initiate medical treatment in the absence of the physician. These orders may be specific to a singular physician or may be orders approved by the hospital medical staff. In the critical care unit; for instance, a physician may develop a set of "standing orders" for postoperative open-heart surgery patients. In this way, the physician does not need to rewrite the orders for each patient. This set of orders then can be modified to meet each patient's specific needs. On the other hand, standing orders approved by the medical staff for the critical care unit is a list of orders to manage emergency situations. Usually the orders include drugs or treatment (e.g., defibrillation) to be administered under circumstances such as cardiac arrhythmia.

# *Appendix 2: Infection Control Administrative Policies*

## Patient care, supply, and equipment

### *Patient care considerations*

#### Hand washing

- Good hand washing is essential to safe, effective, nursing care (see "Hand washing Procedures, Routine and Scrub").
- Hand washing facilities (sink, soap and dispensers, and disposable towels) are available in each patient room and/or patient care area.
- Each patient care unit has a specific written hand washing routine.

#### Housekeeping

- Housekeeping services are available in each patient care area.
- Floors are vacuumed/mopped daily with a germacidal solution (quaternary ammonium cpd).
- All patient rooms are damp-dusted daily using a germicidal solution.
- Spills are cleaned up immediately.
- Medication carts and storage areas are cleaned as needed with a germicidal detergent.
- Nursing shares the responsibility for maintaining a clean, safe, patient environment.

#### Visitors

- To promote the comfort and well being of patients, visitors should keep visits short; a limit of two visitors per patient should be imposed.
- Visitors must be at least 12 years old, with exceptions for acute-care areas and psychiatric units (see specific unit policy).
- Visitors showing obvious signs of illness are asked not to visit.

### *Personnel illness*

- Employee health services are available for personnel who become ill or are injured while on duty.

  (1) Most services at the employee health clinic substation are rendered free of charge to the employee.

  (a) The substation provides primary healthcare for work-related illnesses and injuries to working employees requiring first aid or health counseling.

  (b) Illness or injury of a severe nature is treated by the hospital emergency department.

  (2) Admission to the employee health clinic substation requires that an employee present a properly signed (by supervisor or department head) referral slip to the receptionist in the lobby of the hospital substation.

- Employees exposed to or contracting an infectious disease are referred to employee health services.
- In high-risk patient areas, special precautions are taken to protect both patients and personnel when an infectious condition exists (see unit policy and procedures).

  (1) Patients with communicable diseases are placed on appropriate isolation precautions (see isolation procedure manual).

  (2) Isolation rooms (one per unit) are available in some areas.

  (3) Isolation supply carts are available from Materials Management to facilitate patient care. Isolation supplies are available through the computer system.

  (4) The patient's physician is responsible for ordering isolation

precautions, but it is a nursing responsibility to inform the physician when an infection is suspected.

(5) If the physician does not initiate isolation precautions when indicated, the nursing supervisor should be notified.

(6) It is the responsibility of the nurse manager or his or her designee to ensure that all personnel follow appropriate procedures and that patients and visitors are properly instructed.

(7) Infectious patients transported from their rooms to another department should follow proper protective precautions.

(8) Red labels indicating "blood/body fluid precautions designate infectious patients" and the top line of the addressograph information indicates "B/BF PREC."

## *Supply and equipment considerations*

### Use of Transport Stretchers and Wheelchairs

- Use clean linen for each patient.
- When stretchers/wheelchairs become contaminated (e.g., with drainage), clean the area thoroughly with detergent germicide before replacing clean linen.
- Schedule routine cleaning of wheelchairs and stretchers with the appropriate department (Environmental Services, carpenter shop for caster change and oiling).

### Use of Sterile Irrigation Solutions (Solutions for External Use)

- When a sterile irrigation solution container is opened, note the time and date on the container. Never assume sterility of an opened container.
- Single patient use is recommended.
- If the irrigation solution is used for multiple patients, do not take the container into a patient's room. Sterile solution bowls are used to transfer solutions from the container to the patient's bedside. Use extreme caution in transferring solutions to avoid cross-contamination.
- At *no time* is it acceptable to withdraw sterile irrigating solutions straight from the container to the patient's bedside. This results in contamination of the entire solution and encourages the growth of organisms.
- Use open sterile solutions within an eight- to twelve-hour shift. Discard any remaining solutions.
- Change sterile solutions used for tracheotomy care each shift.
- Cover sterile solution bowls remaining at the bedside adequately to prevent possible contamination during a shift. If there is a question of sterility, discard the entire contents and replace with a sterile bowl and solution.
- Dextrose solutions support the growth of organisms; therefore, change these solutions every 24 hours.

### Preparation of Equipment from Isolation Rooms

- Portable, reusable equipment (hypothermia units, suction regulators, etc.) that has been used in a patient's room and needs to be returned to Sterile Processing/Materials Management should be inspected by the nursing staff. If the equipment is visibly contaminated with blood, sputum, or other body fluids, it should be wiped off with a disinfectant solution by the nursing staff before being sent for repairs or reprocessing.
- Portable, reusable equipment that has been used in the room of a patient who has been on isolation for an infectious disease should be handled similarly; i.e., the equipment should be wiped off with an appropriate disinfectant solution by the nursing staff if it is visibly contaminated.

(1) In addition, equipment from isolation rooms should be bagged in the "contaminated items" bags before being sent for reprocessing.

(2) Items too large to be bagged may simply be covered as much as possible by a "contaminated items" bag after inspection and/or cleaning has been performed by the nursing staff.

- By removing body fluid contamination before the equipment is removed from a patient's room, the chance for spreading pathogenic organisms throughout the hospital environment will be reduced. Also, by bagging equipment from isolation rooms, the staff in sterile processing will be alerted to the use of the equipment in isolation areas and will institute proper cleaning protocols.

Note: This policy does not apply to equipment used for invasive procedures on patients (endoscopes, biopsy needles, etc.).

### Reusable Patient Care Items/Equipment

- Wipe all multiple reusable patient care items (stethoscopes, otoscopes, reflex hammers, etc.) clean after each patient use with alcohol or detergent germicide.
- Empty suction bottles every eight hours unless ordered otherwise, and clean the bottles with detergent germicide every 24 hours. Return suction canisters and regulators to Materials Management for resterilization between patients only when they are contaminated or the patient is on isolation.
- Clean medication carts as necessary with detergent germicide.
- Remove all medications from unit storage shelves at least every three months and clean the compartments with detergent germicide.

### Linen

- Store clean linen in a clean, enclosed storage area and keep it separate from soiled linen.
- Once linen is taken into a patient's room, do not return it to the clean linen closet.
- Discard in the soiled linen hamper clean linen that is dropped on the floor.
- Do not take soiled linen hampers into a patient's room.
- Carry soiled linen away from the body to avoid personnel- and cross-contamination.
- Change linen after each patient use.
- Fold linen inward as it is removed from the bed.
- Cover pillows with antibacterial and waterproof covering and clean the covering with germicidal solution between each patient.

### Needles and Syringes

- Deposit used needles in appropriate containers.
- Discard syringes in appropriate containers.
- When the syringe and needle disposal container is full, place it in the soiled holding/utility room. The plastic containers will be picked up by waste management personnel for disposal.

### Disposal of Supplies from Isolation Rooms

- All supplies that are wrapped are not considered a source of contamination and should not be discarded.
- All open disposable supplies that are used for direct patient care and all supplies that have been unwrapped should be discarded routinely.
- Only the necessary supplies should be stocked in isolation rooms.
- Follow nursing procedures for disinfection or sterilization of patient care equipment.

# *Appendix 3: Pharmacy Department: Medication Errors*

## Administrative Policy
## Pharmacy Department

*Errors: Medication*

Effective date: 5/1995
Review date: 5/1997, 6/1999, 5/2000
Revised: 5/2000

Policy No: E-06
Page 1 of 2

### *Purpose*

To define a system for identifying, reporting, classifying, reviewing, and preventing medication errors (i.e., errors of prescribing, interpreting, dispensing, and administration).

### *Policy*

It is the responsibility of all healthcare providers in the clinical setting to detect and to report medication errors for review by the pharmacy committee.

### *Definitions*

A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer. Such events may be related to professional practice, healthcare products, procedures, and systems, including prescribing: order communication; product labeling, packaging, and nomenclature; compounding; dispensing; distribution; administration; and education monitoring or use.

### Specific types of medication errors are classified as:

1. **Prescribing error:** inappropriate drug selection (based on indications, contraindications, known allergies, existing drug therapy, and other factors) dose, dosage form, quantity, route, concentration, rate of administration, or instructions for use of a drug product ordered by a authorized prescriber.
2. **Omission:** the failure to administer an ordered dose to a patient. Excluded would be (1) a patient's refusal to take the medication, or (2) a decision not to administer the dose because of recognized contraindications.
3. **Wrong time:** the failure to administer a medication dose within a pre-defined interval (i.e., one hour) from its scheduled administration time, unless the patient is undergoing a treatment or procedure that alters the administration time.
4. **Unauthorized drug/wrong drug:** the administration of a dose of medication not authorized to be given to the patient. For example, a patient received IV Lidocaine instead of a 5 percent dextrose solution. Instances of "brand or therapeutic interchange" are not counted as unauthorized drug errors except where prohibited by institutional policy.
5. **Wrong dose:** administration of a dose that is greater than or less than the amount ordered by the prescriber or administration of duplicate doses to the patient, i.e., one or more dosage units in addition to those that were ordered.
6. **Wrong dosage form:** administration of a drug product in a different dosage form than was ordered by the prescriber. An example is the administration of the intramuscular formulation of an injectable agent (by the intramuscular

route) when the intravenous formulation was ordered.

7. **Wrong drug preparation:** drug product incorrectly formulated or manipulated before administration. This would include; for example, incorrect dilution or reconstitution, mixing drugs that are physically or chemically incompatible, and inadequate product packaging.

8. **Wrong administration technique:** inappropriate procedure or improper technique in the administration of a drug. Examples would include doses administered (1) via the wrong route (different from the route prescribed), (2) via the correct route but at the wrong site (i.e., left eye instead of right), and (3) at the wrong rate of administration.

9. **Deteriorated drug:** administration of a drug that has expired or for which the physical or chemical dosage form integrity has been compromised. This would include, for example, use of expired drugs and improperly stored drugs (medications requiring refrigeration that are left at room temperature).

10. **Other medication errors:** any medication error that does not fall into one of the above predefined categories.

## Severity level/outcome codes:

1. The severity codes for all medication errors except prescribing errors are as follows:

Level 1 no patient harm

Level 2 increased patient assessment/ reassessment, non-invasive

Level 3 need for increased assessment/ reassessment, invasive

Level 4 treatment with a drug or increase length of stay or change in participation in drug study

Level 5 potential/permanent patient harm or organ system failure

Level 6 death

2. Prescribing errors, followed by pharmacist intervention may cause potential harm, but not actual harm. An error occurred, but the medication did not reach the patient. The severity codes for prescribing errors are as follows:

Level 1 no potential harm

Level 2 potential additional monitoring, treatment, intervention, hospitalization, and/or increased length of stay. No harm to patient or only temporary harm to patient likely.

Level 3 potential permanent harm

Level 4 potential life-threatening effect

# *Appendix 4: Standing Operating Procedure: Medication Errors*

## Pharmacy Department
## Standing Operating Procedure: Medication Errors

1. When a medication error occurs, the person discovering the error will:
   a) Notify the prescribing physician immediately
   b) Complete a medication occurrence report
   c) Have the unit manager and director sign the report
   d) Document in the patient's chart all medications given to the patient
   e) If an explanation for an omission is apparent (e.g., patient was away from the nursing unit for tests) that reason should be documented in the record
   f ) Notify the pharmacist if the error involves the pharmacy
2. All medication errors and potential errors are trended and reported to the pharmacy committee quarterly. All reported serious medication errors (by definition) will be summarized and reviewed by the pharmacy committee. The report will include the severity level/outcome classifications.
3. The manager of the area where the medication error occurred will determine the appropriate follow-up actions required based on the seriousness of the errors and document the action plan. (The intent of the action plan is for education rather than punishment.)
4. In case of a serious prescribing error, the chairman of the pharmacy committee will consult with the chairman of the medical department of the physician involved.

# *Appendix 5: Five Processes of Care that Affect the Risk of Surgical-Site Infection*

| Process Measurement | Possible Problem Area | Potential System Changes |
|---|---|---|
| 1. Appropriateness and timing of perioperative antimicrobial prophylaxis (PAP) | | |
| Percentage of prophylaxis regimens that are consistent with published guidelines | Patients who require prophylaxis do not receive it<br>Patients who do not require prophylaxis receive it<br>Suboptimal or unnecessarily expensive antimicrobial agent prescribed | Develop hospital guidelines for prophylaxis based on effectiveness and cost<br>Post guidelines for easy reference<br>Use a standard order form |
| Percentage of surgeries <4 h in duration with PAP regimens limited to 1 dose | Regimens providing >1 dose | Same as above<br>Use an order form that prescribes 1 dose; exceptions must be justified |
| Percentage of patients receiving prophylaxis <2 h before incision | Prophylaxis administered too early (2 h before incision) or too late (after incision is made)<br>Responsibility for administering prophylaxis not defined clearly<br>Inadequate supply of antimicrobial agents in preoperative holding area | Administer prophylaxis in preoperative holding area or in the operating room shortly before the incision<br>Designate responsibility for administering prophylaxis<br>Ensure adequate supply of commonly used antimicrobial agents in preoperative holding area |
| 2. Length of preoperative hospital stay | | |
| Length of preoperative hospital stay for elective procedures; reasons for preoperative stay >1 day<br>Percentage of surgeries postponed; reasons for postponement of surgery | Preoperative evaluation completed in the hospital<br>Surgery postponed because preoperative evaluation not completed in time or delay in addressing problems identified by preoperative evaluation | Increase use of outpatient clinics for preoperative evaluation<br>Improve scheduling of routine preoperative evaluations<br>Improve timeliness of reporting of results<br>Streamline solutions for common problems |
| 3. Method and timing of hair removal | | |
| Percentage of patients shaved with a razor | Skin shaved with a razor<br>Shaving performed many hours before surgery | Remove hair only if necessary<br>Remove hair with clippers<br>Remove hair shortly before surgery |

*Continued on next page*

**Appendix 5: Five Processes of Care that Affect the Risk of Surgical-Site Infection (continued)**

| Process Measurement | Possible Problem Area | Potential System Changes |
|---|---|---|
| 4. Skin antisepsis at the site of the incision | | |
| Percentage of procedures where optimal skin antiseptics were used | Antiseptics used not optimal | Use iodophor- or chlorhexidine-containing antiseptics<br>Develop a guideline for skin antisepsis for each procedure (i.e., agents, areas prepped, duration of prep) |
| Percentage of procedures where skin antiseptic was applied properly | Antiseptic applied to too small an area<br>Antiseptic applied improperly | Post guidelines for easy reference |
| 5. Reprocessing methods for surgical instruments and equipment | | |
| Percentage of loads containing implantable devices tested with a biological indicator<br>Percentage of positive biological indicator tests | Quality control of sterilization processes is inadequate | Perform biological indicator test once a week for each autoclave and for each autoclave load containing implantable devices<br>Follow manufacturer's recommendations for preventive maintenance |

Adapted from Huskins et al. (1998)

# *Appendix 6: Routine Hand Washing Procedure*

## Purpose:

To prevent the spread of communicable, potentially pathogenic, organisms within the hospital environment.

### *General Information:*

- Wash hands before and after any direct and indirect patient contact
- Wash hands before and after performing any personal body functions for self or patient (includes eating, blowing or wiping nose, using the bathroom, and combing hair)
- Wash hands before preparing or serving food or medications
- Wash hands after handling waste material, secretions, drainage, or other body fluids
- Wash hands after arrival at the hospital and before going home

### *Procedure*

| Action | Key Points |
|---|---|
| 1. Turn on the faucet and adjust the flow of the water temperature | Warm water will not dry out skin as hot water does |
| 2. Wet hands to the wrists | |
| 3. Apply soap to hands | |
| 4. Rub hands together, using friction | |
| 5. Wash between fingers and around nails | |
| 6. Rinse hands thoroughly under running water | |
| 7. Turn off the faucet, using the towel | Avoid recontamination |
| 8. Discard the towel. Do not use soiled towel. If paper towels or individual towels are not available, allow the hands to air dry | |

# *Appendix 7: Postoperative Care Protocol (First 24 Hours)*

## Expected Outcome:

The patient will recover from the surgical procedure without experiencing complications.

## Interventions:

1. Bedrest, turn patient every two hours
2. Ice chips only, assess for nausea and vomiting
3. Check urine output every hour for first 12 hours (should be 30cc/hour or greater)
4. Monitor IV fluids, assess site every 12 hours
5. Assess for bowel sounds every 8 hours
6. Deep breathe every two hours
7. Assess lungs every 12 hours
8. Assess color and warmth of skin every 8 hours
9. Assess surgical dressing on admission to ward, then every 4 hours
10. Assess need for pain relief, medicate as indicated
11. Explain to patient and family what they can expect regarding care and treatment

# *Appendix 8: Clinical Pathway: Postoperative Patients*

| **Category**<br>**Discharge Outcomes** | **Operative Day** | **Postoperative day 1** | **Postoperative day 2** |
|---|---|---|---|
| **Exercise/Rest**<br>Patient will tolerate prescribed activity. | Bedrest, turn every 2 hours<br>Set at bedside 12 hours postoperative | Assist to bathroom<br>Up in chair with assistance<br>Ambulate with assistance | Up ad lib |
| **Nutrition/Fluid**<br>Patient will tolerate prescribed diet without nausea and vomiting. | NPO/ice chips<br>Assess for nausea & vomiting<br>Record intake & output every 12 hours<br>Check urine output every hour for the first 12 hours (should be 30cc/hr or greater)<br>Monitor intravenous fluids as ordered | Advance to prescribed diet<br>– – – – – – – – – – ►<br>– – – – – – – – – – ►<br>Check urine output three times a day<br>Discontinue intravenous fluids per Doctor's orders | Prescribed diet |
| **Elimination**<br>Patient will have a non-distended abdomen with bowel sounds present & pass flatus.<br>Patient will urinate or (if catheter) produce urine without difficulty & have no bladder distention. | GI assessment q 12 hours<br>GU assessment, palpate bladder prn<br>If Foley present, assess need daily | – – – – – – – – – – ►<br>– – – – – – – – – – ►<br>Discontinue catheter as ordered, measure output for 8 hours after catheter discontinued | – – – – – – – – – – ►<br>– – – – – – – – – – ►<br>If no documented BM, obtain order for stool softener or laxative |
| **Oxygenation**<br>Patient will have normal respirations without dyspnea or cough. | Lung assessment every 12 hours<br>Deep breath every 2 hours | – – – – – – – – – – ►<br>– – – – – – – – – – ► | – – – – – – – – – – ► |
| **Circulation**<br>Patient will have stable vital signs.<br>Patient will have warm/dry skin of normal color with palpable pulses without edema. | Take vital signs on arrival from surgery, then every 30 min x 2, and every 4 hours x 24 hours<br>Assess for color/warmth<br>Assess for edema every 8 hours | Take vital signs twice a day or as ordered by the Doctor<br>Assess every 12 hours<br>Assess every 12 hours | – – – – – – – – – – ►<br>– – – – – – – – – – ► |

*Continued on next page*

**Appendix 8: Clinical Pathway: Postoperative Patients (continued)**

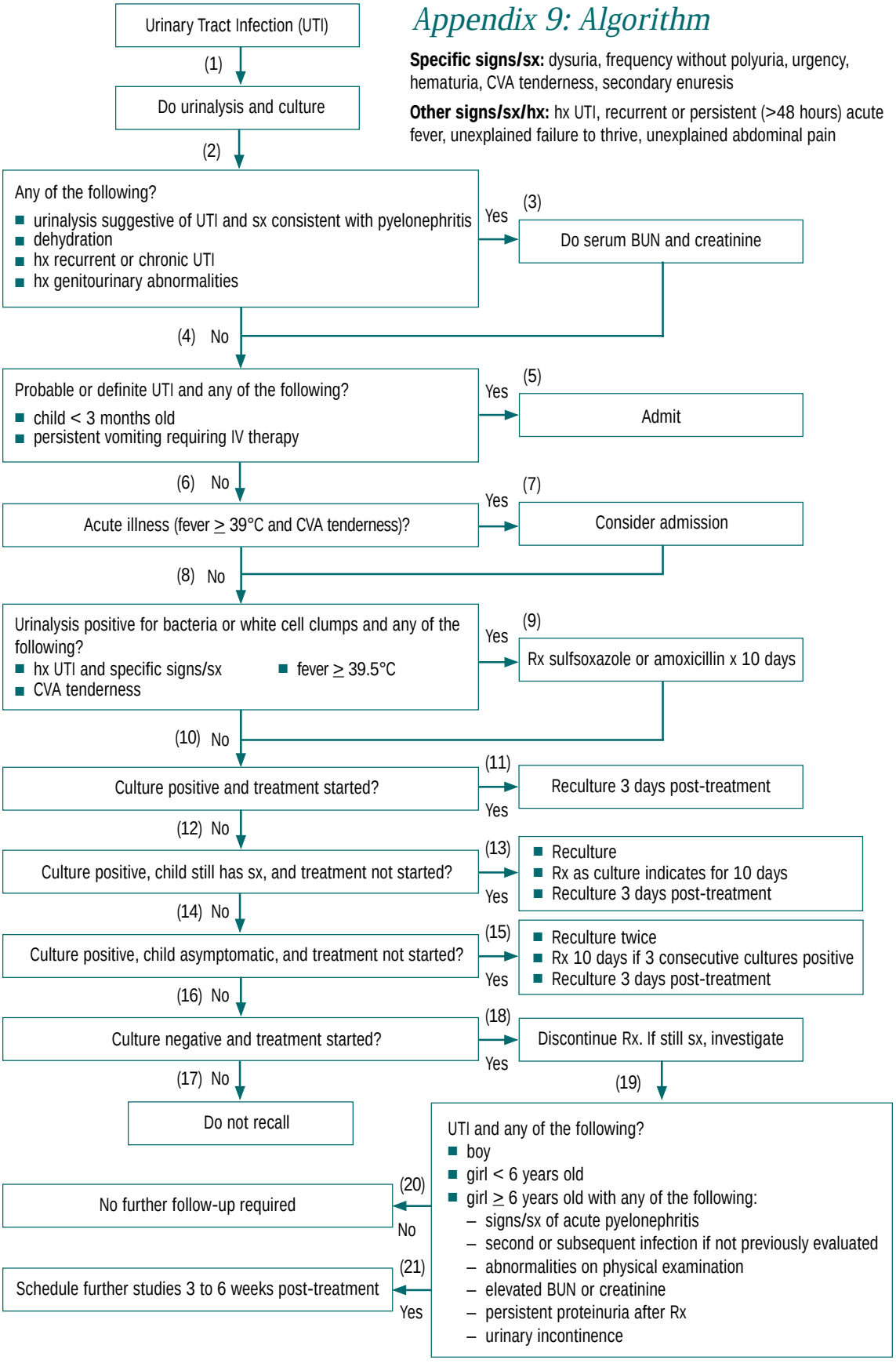
| Category<br>Discharge Outcomes | Operative Day | Postoperative day 1 | Postoperative day 2 |
|---|---|---|---|
| **Skin Integrity/ Infection Control**<br>Patient's incision site(s) will be well approximated without redness, pain, drainage & swelling. | Assess surgical dressing on admission to the ward from surgery then, every 4 hours x 2, then prn | Assess incision every 12 hours<br>Remove dressings as ordered by Doctor | Remove staples as ordered<br>– – – – – – – – – – → |
| Patient's skin will have no breakdown. | Assess skin integrity<br>Pressure ulcer prevention protocol as indicated | – – – – – – – – – – →<br>– – – – – – – – – – → | – – – – – – – – – – →<br>– – – – – – – – – – → |
| Patient's intravenous sites are free of redness, hematoma, pain, drainage, or swelling. | Assess intravenous site every 12 hrs and prn | Discontinue intravenous fluids as ordered by Doctor | |
| **Pain Management**<br>Patient will verbalize/ indicate comfort. | Assess need for analgesia | – – – – – – – – – – → | – – – – – – – – – – → |
| **Discharge Plan/ Education**<br>Patient/family will demonstrate understanding and mutually agree with plan of care and discharge instructions. | Inform patient and family about what they can expect regarding care and treatment | Instruct patient and family on plan of care including:<br>Management of pain<br>Management of wound<br>Signs of infection<br>Medications<br>When to seek additional care or treatment | Give patient and family written instructions if appropriate<br>Provide patient/family with any additional follow-up care instructions |
| Each healthcare worker who makes an assessment or provides care needs to date and sign this form on the appropriate day. | Date _____<br>Time _____<br>Signature _____<br>_____<br>Date _____<br>Time _____<br>Signature _____<br>_____<br>Date _____<br>Time _____<br>Signature _____<br>_____ | Date _____<br>Time _____<br>Signature _____<br>_____<br>Date _____<br>Time _____<br>Signature _____<br>_____<br>Date _____<br>Time _____<br>Signature _____<br>_____ | Date _____<br>Time _____<br>Signature _____<br>_____<br>Date _____<br>Time _____<br>Signature _____<br>_____<br>Date _____<br>Time _____<br>Signature _____<br>_____ |

**Note:** This **clinical pathway** to be used to help guide care and may change by physician orders and/or nursing judgment.

# *Appendix 9: Algorithm*

**Specific signs/sx:** dysuria, frequency without polyuria, urgency, hematuria, CVA tenderness, secondary enuresis

**Other signs/sx/hx:** hx UTI, recurrent or persistent (>48 hours) acute fever, unexplained failure to thrive, unexplained abdominal pain



# Glossary

*Administrative policy:* A statement of expectation written by the management of institutions designed to influence and determine decisions and actions.

*Algorithm:* Recommended patient management strategies designed to direct decision-making such as a structured flowchart, decision tree, or decision grid. Often algorithms are used in areas in which rapid decision-making is required, e.g., emergency department.

*Clinical pathways:* Patient care management tools that organize, sequence, and time the major interventions of nursing staff, physicians, and other departments for a particular case type (e.g, normal delivery), subset (e.g., hysterectomy), or condition (e.g., failure to wean) (Zander 1997). Synonyms: critical path, care map.

*Clinical practice guidelines:* A set of systematically developed statements, usually based on scientific evidence, to assist practitioners and patient decision-making about appropriate healthcare for specific clinical circumstances (Field and Lohr 1992) Synonyms: practice guidelines, guidelines, practice parameters.

*Inputs:* The resources required by an organization to provide a service. Inputs required in healthcare are usually financial, physical structures such as buildings, supplies and equipment, personnel, and more importantly, clients. Synonym: structure standards.

*Job description:* A document outlining the roles and responsibilities of a particular position. The purpose of the position and the qualifications required are typically included.

*Norms:* A term used in some countries as a synonym for standards.

*Outcome:* Results of a process including outputs, effects and impacts.

> *Health outcomes:* The effect from performance (or nonperformance) of one or more processes or activities carried out by healthcare providers. For instance, the effect of the healthcare process on community health status such as nutritional status, patient satisfaction, and mortality rates.

*Procedure:* Step-by-step instructions on how to perform a task based on technical and theoretical knowledge (Marker 1988).

*Process:* A series of related activities and tasks that transform the inputs (resources) to produce a desired product or outcome.

*Protocol:* A plan, or set of steps, to be followed in a study, an investigation, or an intervention, as in the management of a specific patient condition (e.g., care of a patient with diarrhea).

*Qualifications:* Characteristics—such as education, background, and experience—that a person brings to a specific position or task.

*Rules and regulations:* A set of one or more statements or directions that specify decisions and actions that must always be followed, and if not followed, a penalty for failure to observe often is enacted.

*Specifications:* An explicit statement of the required characteristics for an input used in the healthcare system. The requirements are usually related to supplies, equipment, and physical structures used in the delivery of health services.

*Standard:* A statement of expected quality.

*Standing operating procedures:* Management processes that describe chronological steps to follow and decisions to make in carrying out a task or function. Synonym: management procedure.

*Standing orders:* Physician orders pre-established and approved for use by nurses and other professionals under specific conditions in the absence of a physician.

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## Resources

Since this *Health Manager's Guide* lacks information on how to develop standards and indicators, this list of resources will help readers find organizations that may have published materials on quality indicators and hospital standards. In addition, organizations are listed that provide information and guidance in quality healthcare and development of standards.

| Organizations | Website/E-Mail Addresses |
|---|---|
| *Standards and Statistics* | |
| Centers for Disease Control and Prevention (CDC)<br>1600 Clifton Road<br>Atlanta, GA 30333<br>(1 404) 639-3534 | www.cdc.gov |
| The CDC develops health data standards, scientific data, surveillance, health statistics reports and laboratory information. | |
| Center for International Health Information (CIHI)<br>1601 N. Kent St., Suite 1014<br>Arlington, VA 22209<br>(1 703) 524-5225 (1 703) 243-4669 FAX | www.cihi.com/publist.htm<br>E-mail: info@cihi.com |
| CIHI publishes *Health Statistics Reports* (e.g., mortality rates, contraceptive prevention statistics) and *Country Health Profiles* for all the developing countries that receive assistance from USAID. | |
| The Cochrane Library<br>Update Software Ltd.<br>Summertown Pavilion<br>Middle Way<br>Oxford OX2 7LG<br>ENGLAND<br>(44 186) 551-3902 (44 186) 551-6918 FAX | www.cochrane.co.uk<br>E-mail: info@update.co.uk |
| The Cochrane Library is an electronic publication (CD-Rom and Internet) of quality healthcare evidence, based on reviews of randomized controlled trials. | |
| Department of Health and Human Services (DHHS)<br>200 Independence Avenue SW<br>Washington, DC 20201<br>(1 202) 619-0257 | E-mail: hhsmail@os.dhhs.gov |
| Indicators have been established for "Healthy People 2010" to promote health and prevent disease. A new document entitled "National standards to protect patient's personal records" has been published. | |
| Emergency Care Research Institute (ECRI)<br>5200 Butler Pike<br>Plymouth Meeting, PA 19462-1298<br>(1 610) 825-6000 (1 610) 834-1275 FAX | www.ecri.org<br>E-mail: info@ecri.org |
| ECRI provides evidence-based reports for clinical guideline development. | |

| Organizations | Website/E-Mail Addresses |
|---|---|
| EngenderHealth<br>440 Ninth Avenue<br>New York, NY 10001<br>(1 212) 561-8000 (1 212) 561-8067 FAX<br><br>EngenderHealth focuses on reproductive health and formulates medical and surgical guidelines related to contraception, pregnancy, infections, and diseases. | www.engenderhealth.org<br>E-mail: info@engenderhealth.org |
| Family Health International (FHI)<br>P.O. Box 13950<br>Research Triangle Park, NC 27709<br>(1 919) 544-7040 (1 919) 544-7261 FAX<br><br>HIV/AIDS Department<br>2101 Wilson Boulevard, #700<br>Arlington, VA 22201<br>(1 703) 516-9779 (1 703) 516-9781<br><br>FHI focuses on research, education, and services in family planning, HIV/AIDs and sexually transmitted diseases prevention and care. | www.fhi.org<br>E-mail: services@fhi.org |
| HIV/AIDS Treatment and Information Service<br>P.O. Box 6303<br>Rockville, MD 20849-6303<br>(1 301) 519-0459 (1 301) 519-6616 FAX<br><br>The Treatment Guidelines Library includes federally approved guidelines regarding HIV and AIDS. | www.hivatis.org<br>E-mail: atis@hivatis.org |
| International Organization for Standardization<br>ISO Central Secretariat<br>1 rue de Varembre, Case postal 56<br>CH-1211 Geneva 20<br>SWITZERLAND<br>(41 22) 749-0111 (41 22) 733-3430 FAX<br><br>The International Organization for Standardization promotes the development of standardization such as ISO 9000 international standards for quality management. A catalog of standards can be accessed through the website. | www.iso.ch<br>E-mail: central@iso.ch |
| International Planned Parenthood Federation<br>Public Affairs Department<br>Regent's College, Inner Circle<br>Regent's Park, London NW1 4NS<br>ENGLAND<br>(44 207) 487-7900 (44 207) 487-7950 FAX<br><br>IPPF sets standards for contraceptive safety, program management, service provision, and gender equity. | www.ippf.org<br>E-mail: info@ippf.org |

| Organizations | Website/E-Mail Addresses |
|---|---|
| INTRAH<br>University of North Carolina at Chapel Hill<br>School of Medicine<br>1700 Airport Road #300<br>Chapel Hill, NC 27599-8100<br>(1 919) 966-5636 (1 919) 962-7178 FAX | www.intrah.org<br>E-mail: intrah@intrah.org |
| INTRAH has developed guidelines for clinical procedures in family planning. | |
| JHPIEGO<br>1615 Thames Street #200<br>Baltimore, MD 21231<br>(1 410) 955-8558 (1 410) 955-6199 FAX | www.jhpiego.org<br>E-mail: info@jhpiego.org |
| JHPIEGO's goal is to improve health of women and families through reproductive health services and essential obstetrical care. They develop and test treatment protocols and have an infection control course. | |
| Johns Hopkins International<br>550 N. Broadway, #201<br>Baltimore, MD 21205<br>(1 410) 614-9150 | www.jhintl.net<br>www.jhis@jhmi.edu |
| Johns Hopkins has policies regarding infection prevention and control, including surveillance protocols, case definitions, and forms used to collect data. | |
| The Joint Commission on Accreditation of Healthcare Organizations (JCAHO)<br>One Renaissance Boulevard<br>Oakbrook Terrace, IL 60181<br>(1 630) 792-5000 (1 630) 792-5005 FAX | www.jcaho.org |
| JCAHO evaluates and accredits healthcare organizations. They publish accreditation standards for healthcare systems, books on improving quality, the Journal on Quality Improvement and the National Library of Healthcare Indicators. | |
| Management Sciences for Health (MSH)<br>165 Allandale Road<br>Boston, MA 02130-3400<br>(1 617) 524-7799 (1 617) 524-0783 FAX | www.msh.org<br>E-mail: erc@msh.org |
| *The Guide to Reproductive Health Indicators at the National and Local Levels* presents examples of indicators for six areas of reproductive health, including family planning; maternal health; child health; adolescent health; and services for reproductive tract infections, sexually transmitted diseases, and HIV. The Electronic Resource Center (www.erc.msh.org) is a web-based center for education and training. | |
| Marker Systems Inc.<br>Post Office Box 309<br>Severna Park, MD 21146 USA<br>(1 410) 544-0251 (1 410) 544-3544 FAX | |
| The Marker Management System is focused on standards of care and practice in hospitals. | |

| Organizations | Website/E-Mail Addresses |
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| Population Action International (PAI)<br>1300 19th Street NW, 2nd Floor<br>Washington, DC 20036<br>(1 202) 557-3400 (1 202) 728-4177 FAX | www.populationaction.org<br>E-mail: pai@popact.org |
| PAI published "Reproductive Risk: A Worldwide Assessment of Women's Sexual and Maternal Health" based on ten indicators that resulted in a Reproductive Risk Index. | |
| The Pan American Health Organization (PAHO)<br>(Organización Panamericana de la Salud/OPS)<br>525 23rd Street, NW<br>Washington, DC 20037<br>(1 202) 974-3000 (1 202) 974-3663 FAX | www.paho.org<br>E-mail: publinfo@paho.org |
| PAHO publishes *Hospital Accreditation for Latin America and the Caribbean* (1991) and *Health Statistics in the Americas*. | |
| United Nations<br>2 UN Plaza, Room DC2-853<br>United Nations Publications, Dept. C001<br>New York, NY 10017<br>(1 800) 253-9646 (1 212) 963-3489 FAX | www.un.org/Docs<br>E-mail: publications@un.org |
| The United Nations offers publications about population, demography, administration of family planning activities, morbidity, mortality, and economic development. The *Demographic Yearbook* and the *Compendium of Social Statistics and Indicators* include demographic and population statistics that are country-specific. | |
| World Health Organization (WHO)<br>Avenue Appia 20<br>1211 Geneva 27<br>SWITZERLAND<br>(41 22) 791-2111 (41 22) 791-3111 FAX | www.who.org<br>E-mail: info@who.int |
| WHO provides information regarding international health policies, statistics, and systems. The Integrated Management of Childhood Illness (IMCI) is one of the initiatives in which WHO is involved. The library catalog can be located at www.who.int/hlt. Surveillance standards for various communicable diseases have been developed. | |

| Organizations | Website/E-Mail Addresses |
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| *Indicators* | |
| Acute Health Division<br>Department of Human Services<br>555 Collins Street<br>Melbourne, Victoria, 3000<br>AUSTRALIA<br>(61) 3 9616 7777 (61) 3 9616 8471 FAX | www.dhs.vic.gov.au/ahs<br>E-mail:<br>Warwick.bullen@dhs.vic.gov.au |
| The Acute Health Division, Department of Human Services has written *Acute Health Performance Indicators: Strategy for Victoria.* | |
| American Public Health Association<br>800 I Street, NW<br>Washington, DC 20001<br>(1 202) 777-2742 (1 202) 777-2534 FAX | www.apha.org |
| The American Public Health Association published a document entitled *Monitoring Children's Health: Key Indicators, 2nd Edition.* | |
| NHS Executive Trent<br>Fulwood House<br>Old Fulwood Road<br>Sheffield 6103TH<br>ENGLAND<br>(44 114) 282-0441 (44 114) 282-0397 FAX | www.nhsetrent.gov.uk<br>E-mail:<br>webmaster@nhsetrent.gov.uk |
| The NHS published "Quality and Performance" in the *NHS: High Level Performance Indicators* in June 1999. | |
| The Quality Indicator Project (QI Project)<br>The Association of Maryland Hospitals & Health Systems<br>Quality Indicator Project<br>6820 Deerpath Road<br>Elkridge, MD 21075-6234<br>(1 410) 379-6200 (1 410) 379-8239 FAX | www.qiproject.org<br>E-mail:<br>communicate@mhaonline.org |
| The QI Project specializes in clinical performance measurement and national comparative databases for acute care hospitals, psychiatric care facilities, long-term care facilities, and home care agencies. | |
| United States Agency for International Development (USAID)<br>Ronald Reagan Building<br>Washington, DC 20523-1000<br>(1 202) 712-4810 (1 202) 216-3524 FAX | www.info.usaid.gov |
| USAID has a database, the Development Experience System (DEXS), of technical and program documents (docorder@dec.cdie.org) from projects funded by USAID. Indicators are available such as Health and family planning indicators (www.info.usaid.gov/regions/afr/hhraa/indicators/indicators1.htm) and Handbook of Indicators for HIV/AIDS/STI (www.synergyaids.com/indicators.htm). | |

| Organizations | Website/E-Mail Addresses |
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| *Quality Organizations* | |
| Center for Quality of Care Research and Education (QCARE)<br>677 Huntington Avenue<br>Boston, MA 02115<br>(1 617) 432-2027 (1 617) 432-3199 FAX | www.hsph.harvard.edu/qcare<br>E-mail:<br>webexec@hsph.harvard.edu |
| QCARE develops and disseminates methods for improving quality of medical care. QCARE research is focused on design, development and testing of clinical performance measures. | |
| International Society for Quality in Health Care (ISQua)<br>Level 9, Aikenhead Centre<br>St. Vincent's Hospital, 41 Victoria Parade<br>Fitzroy, Victoria 3065<br>AUSTRALIA<br>(61) 3 9417 6971 (61) 3 9417 6851 FAX | www.isqua.org.au<br>E-mail: isqua@isqua.org.au |
| ISQUA is an organization of healthcare leaders that has initiated the International Indicator Initiative to develop clinical indicators. The group is working on internationally agreed quality terminology and publishes the ISQua journal. | |
| The National Association for Healthcare Quality (NAHQ)<br>4700 W. Lake Avenue<br>Glenview, IL 60025<br>(1 800) 966-9392 (1 847) 375-6320 FAX | www.nahq.org<br>E-mail: info@nahq.org |
| NAHQ publishes the *Journal for Healthcare Quality* (JHQ). | |
| Partnerships for Health Reform (PHR/HPSS)<br>ABT Associates Inc.<br>4800 Montgomery Lane #600<br>Bethesda, MD 20814<br>(1 301) 913-0500 (1 301) 652-3916 FAX | E-mail:<br>puborder@phrproject.com |
| PHR works to improve health policy and strengthen health systems. PHR has worked with international organizations to develop measures of quality under health sector reform. | |
| Quality Assurance Project (QAP)<br>7200 Wisconsin Avenue, Suite #600<br>Bethesda, MD 20814-4811<br>(1 301) 654-8338 (1 301) 941-8427 FAX | www.qaproject.org<br>qapdissem@urc-chs.com |
| QAP works with lesser-developed countries to improve their quality and efficiency of health care through institutionalizing quality assurance. QAP provides expertise in the development and communication of health care standards as well as quality improvement methodologies. | |

| Organizations | Website/E-Mail Addresses |
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| Quality Measurement Advisory Service (QMAS)<br>705 Second Avenue, Suite 703<br>Seattle, WA 98104<br>(1 206) 682-2811, Ext. 16 (1 206) 682-3739 FAX<br><br>The report on *Assessing Hospital Performance* introduces a range of dimensions of hospital quality that can be measured. | www.qmas.org |
| University Research Corporation (URC)<br>Quality and Performance Institute<br>7200 Wisconsin Avenue, Suite #600<br>Bethesda, MD 20814-4811<br>(1 301) 654-8338 (1 301) 941-8650 FAX<br><br>URC's Quality and Performance Institute (QPI) uses new technology and research findings to improve program management, operations, and outcomes. One of the QPI's projects is the Quality Assurance Project. | www.urc-chs.com |

## *Professional Organizations*

Various professional organizations develop standards of practice for their particular specialties. Some of these organizations are listed below.

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| American Academy of Family Physicians | www.aafp.org |
| American Academy of Pediatrics | www.aap.org |
| American Association of Critical-Care Nurses | www.aacn.org |
| American College of Obstetricians and Gynecologists | www.acog.org |
| American College of Physicians | www.acponline.org |
| American College of Surgeons | www.facs.org |
| American Hospital Association | www.aha.org |
| American Medical Association | www.ama-assn.org |
| American Red Cross | www.redcross.org |
| British Medical Association | www.bma.org.uk |
| The Association of Women's Health, Obstetric and Neonatal Nurses | www.awhonn.org |
| Emergency Nurses Association | www.ena.org |
| International Federation of Gynecology and Obstetrics | www.figo.org |
| Oncology Nursing Society | www.ons.org |

## *Evidence-Based Medicine*

National Guideline Clearinghouse is a public resource for evidence-based clinical practice guidelines; it can be accessed through www.guidelines.gov.

Evidence Based Medicine – F2000 is a discussion forum for medical professions on evidence-based medicine. www.egroups.com/group/ebm-f2000.